

NOV 30 1920

Medical Lib.

Vol. I

NOVEMBER, 1920

No. 2

THE AMERICAN JOURNAL OF OBSTETRICS AND GYNECOLOGY

EDITORIAL BOARD

C. W. BARRETT *all*
C. L. BONIFIELD
J. WHELEY BOVER
W. W. CHIPMAN
JOHN G. CLARK
H. S. CROSSEN
THOMAS CULLEN
EDWARD P. DAVIS
J. B. DELEE
ROBERT L. DICKINSON
PALMER FINDLEY

ROBERT T. FRANK
GEORGE GELLHORN
ALBERT GOLDSPOHN
WILLIAM P. GRAVES
HERMAN E. HAYD
BARTON C. HIRST
E. J. ILL
J. C. LITZENBERG
F. W. LYNCH
FRANKLIN H. MARTIN
C. JEFF MILLER

GEO. H. NOBLE
REUBEN PETERSON *aa*
JOHN OEDSEN POLAK
F. F. SIMPSON
HENRY SCHWARTZ
HOWARD C. TAYLOR
THOMAS J. WATKINS
B. P. WATSON
GEORGE GRAY WARD, JR.
J. WHITRIDGE WILLIAMS
E. GUSTAV ZIESEN

REPRESENTING

THE AMERICAN GYNECOLOGICAL SOCIETY
THE AMERICAN ASSOCIATION OF OBSTETRICIANS AND GYNECOLOGISTS
THE OBSTETRICAL SOCIETIES OF NEW YORK, PHILADELPHIA, BROOKLYN

Editor, **GEORGE W. KOSMAK**
Associate Editor, **HUGO EHRENPFEST**

Published Monthly by
THE C. V. MOSBY COMPANY
ST. LOUIS

Foreign Depots:

HIRENFELD BROS., Ltd., London, England.
STIRLING & COMPANY, Melbourne, Australia.
EMILE BOUGAULT, Paris, France.

EDWARD EVANS & SONS, Ltd., Shanghai, China.
MCALPIN & COMPANY, Ltd., Toronto, Canada.
MARUEN COMPANY, Ltd., Tokyo, Japan.

(Entered as Second-Class Matter October 23, 1920, at the Post Office at St. Louis, Mo., under the Act of March 3, 1879).

Articles to be Published in Early Numbers of the **AMERICAN JOURNAL OF OBSTETRICS and GYNECOLOGY**

Sterility in the Female: Report of Cures (Operative).—Charles C. Child, New York, N. Y.

Report of a new method of shortening the Round Ligaments of the Uterus with End Results in 100 Cases.—Hermann Grad, New York, N. Y.

A New Method of Vesical Anesthesia.—Henry D. Furniss, New York, N. Y.

Version.—Irving W. Potter, Buffalo, N. Y.

The Unmarried Mother Before and After Confinement.—Foster S. Kellogg, Boston, Mass.

The Problem of the Expectant Mother in Rural Communities.—L. G. Bigelow, Armour, S. D.

Some Interesting Surgical Conditions of the Liver and Biliary Tract.—Joseph H. Branham, Baltimore, Md.

Where the Rubber Glove is Behind the Times.—Robert T. Morris, New York, N. Y.

Hernia of the Ileum Through a Rent in the Mesentery.—Wm. E. Darnall, Atlantic City, N. J.

Lutein Cysts Accompanying Hydatiform Mole.—W. A. Coventry, Duluth, Minn.

Cancer of the Uterus in Young Women.—Gordon Gibson, Brooklyn, N. Y.

Microscopical Studies of Tubal Pregnancy. J. C. Litzenberg, Minneapolis, Minn.

Toxic Vomiting of Early Pregnancy.—R. T. LaVake, Minneapolis, Minn.

Large Ovarian Cyst with Twisted Pedicle Complicating Pregnancy.—Carter S. Fleming, Fairmont, W. Va.

Glycosuria During Pregnancy.—Roland S. Cron, Ann Arbor, Mich.

Early and Late Causes of Abdominal Diseases.—Hugo O. Pantzer, Indianapolis, Ind.

Cesarean Section.—Charles A. Stillwagon, Pittsburg, Pa.

Results Obtained with the Double-Flap Low Cesarean Section.—Thurston S. Welton, Brooklyn, N. Y.

A Preliminary Report of Pyelitis in Pregnancy.—Greer Baughman, Richmond, Va.

The Education of Nurses for Obstetric Service.—Sylvester J. Goodman, Columbus, O.

Missed Abortion.—J. C. Litzenberg, Minneapolis, Minn.

The Treatment of Abortion Complicated by Sepsis.—George A. Peck, New Rochelle, N. Y.

Delivery of Adherent Placenta in Abortion.—Charles E. Ruth, Des Moines, Iowa.

Rupture of the Bladder During Labor.—John W. Poucher, Poughkeepsie, N. Y.

My Method of Performing Version.—Irving W. Potter, Buffalo, N. Y.

The Common Pathological Lesions which are Classed as Puerperal Infection.—John O. Polak, Brooklyn, N. Y.

Splenic Leucemia Associated with Pregnancy.—Geo. W. Kosmak, New York, N. Y.

Childlessness.—Charles A. L. Reed, Cincinnati, Ohio.

Some Cases of Thrombophlebitis During the Puerperium Following an Attack of Influenza.—Lewis F. Smean, Toledo, O.

Benign Mammary Tumors and Intestinal Toxemia.—W. Seaman Bainbridge, New York, N. Y.

A New and Modern Treatment of Cancer of the Breast.—James F. Percy, San Diego, Cal.

Some Indications for Hysterectomy.—James F. Baldwin, Columbus, Ohio.

Intramural Uterine Fibroid Enucleated Through the Anterior Vaginal Cul-de-sac.—Rufus B. Hall, Cincinnati, Ohio.

Fibroid of the Ovary.—Edmund D. Clark, Indianapolis, Ind.

Cysto-Papilloma of the Ovary.—John F. Erdmann, New York, N. Y.

Dermoid Cysts of the Ovary; Etiology, Diagnosis, and Treatment.—Benjamin R. McClellan, Xenia, Ohio.

Certain Procedures in Vaginal Surgery.—Samuel W. Bandler, New York, N. Y.

Gehrung Pessary.—Edward J. Ill, Newark, N. J.

Enuresis.—John W. Keefe, Providence, B. I.

The American Journal of Obstetrics and Gynecology

VOL. I.

ST. LOUIS, NOVEMBER, 1920

No. 2

Original Communications

AN ANALYSIS OF THE FAILURES IN RADIUM TREATMENT OF CERVICAL CANCER.*

BY FREDERICK J. TAUSSIG, M.D., F.A.C.S., ST. LOUIS, MO.

Gynecologist, Barnard Free Skin and Cancer Hospital

THE wonderful palliative results and considerable number of cures following the radium treatment of cervical cancer have been satisfactorily established in the reports of various clinics in the last five years. In the future our efforts should be directed not to the narration of occasional successes, but to the analysis of our still far too frequent failures with this method of treatment. Only by such a critical review of the technic and results of various methods of treatment can we hope to find measures that will bring our permanent results to a point in advance of those obtained by surgery.

My own experience dates back to November, 1917, when, following a stay of two weeks at the Memorial Hospital in New York, studying the technic and results of radium treatment at that institution, I began treatment of our cases at the Barnard Free Skin and Cancer Hospital (services of Dr. George Gellhorn and myself). From that time to March 1 of this year, I have treated 86 cases† of cervical cancer and 6 cases of vulvar cancer, partly in combination with surgical measures. While it is of no special interest to give percentages on the basis of an experience of but two and one-half years, the immediate results can be seen in the accompanying table:

These immediate results are far from inspiring, but this must, in part, be attributed to the fact that we sought in the first year and a half to include every case sent to our institution no matter how wretched the patient's condition.

*Read at the Forty-Fifth Annual Meeting of the American Gynecological Society, Chicago, May 24-26, 1920.

†Of this number, 21 cases were treated in private practice, and 5 were assigned to me at Barnes Hospital, through the courtesy of Dr. Henry Schwarz.

NOTE: The editor accepts no responsibility for the views and statements of authors as published in their "Original Communications."

RESULTS OF RADIUM AND OPERATIVE TREATMENT OF 86 CASES OF CERVICAL AND VAGINAL CANCER

November 1917-March 1920

| TOTAL | EARLY OPERABLE 3 | | ADVANCED OPERABLE 6 | | BORDER- LINE 13 | | INOPER- ABLE 52 | | ADVANCED INOPERABLE 12 | | TOTAL 86 | |
|--------------------|------------------------|---|---------------------------|---|-----------------------|---|-----------------------|---|------------------------------|---|-------------|----|
| | Rad. Oper. | | Rad. Oper. | | Rad. Oper. | | Rad. Oper. | | Rad. Oper. | | Rad. Oper. | |
| Number of cases | 1 | 2 | 0 | 6 | 6 | 7 | 52 | 0 | 12 | 0 | 71 | 15 |
| Free of recurrence | 1 | 2 | 0 | 2 | 3 | 2 | 7 | 0 | 0 | 0 | 11 | 6 |
| Recurrent | 0 | 0 | 0 | 1 | 0 | 2 | 11 | 0 | 0 | 0 | 11 | 3 |
| Dead | 0 | 0 | 0 | 2 | 3 | 3 | 29 | 0 | 11 | 0 | 43 | 5 |
| Not traced | 0 | 0 | 0 | 1 | 0 | 0 | 5 | 0 | 1 | 0 | 6 | 1 |

All operative cases were given radium treatment either before or after hysterectomy or at both times.

When one sees an occasional desperate case show marked improvement, it is a great temptation to extend the indication of radium treatment to the utmost limits. We have, however, come to the same conclusion as Bailey, that the chance for doing harm is so much greater than for doing good that these women had better be given acetone treatment and opiates. Radium only leads to increased suffering.

There is still some argument as to whether roentgenologist or gynecologist is better qualified to give radium in this special field. Personally, I believe that the difficulties of bimanual examination in these cases require the services of a trained gynecologist for correct interpretation of results. The roentgenologist, even with occasional examinations by a specialist, cannot properly keep track of results of treatment or be able to judge the suitable dosage. Neither does it follow that every gynecologist can or should become expert in this special field of work. We should make a distinction between the treatment of benign and malignant conditions. Every gynecologist should qualify himself to use radium in the treatment of fibroids and the myopathic uterus. The necessary experience can be acquired quickly. Far different is it with the treatment of cancer. Here we have a problem whose complexity puzzles even those of us who have been working with radium for years. Offhand, I should say that the technic of the radical Wertheim operation for cervical cancer was simplicity itself, compared to the technic of radium treatment in this disease. To properly qualify for this work, one should not only undertake preliminary studies by visiting for several weeks the large radium clinics in this country but have access to a considerable cancer material for continued study and treatment. Much also is to be gained by keeping in touch with the manner of treatment and results of radium treatment in cancer of other organs.

No matter how careful the preliminary training, however, mistakes are unavoidable. We must all learn in the school of experience. Perhaps the first and most general mistake is the attempt to extend too widely the limits of radium treatment. When one sees a perfectly hopeless case suddenly take a new lease on life, change from a bed-ridden morphine addict with large foul-smelling cervical crater to an apparently healthy woman, able to do her work

for a period lasting over two and one-half years, it is no wonder enthusiasm overleaps its bounds. Such was the case in one of our patients whose record is worthy of special note.

Annie S., aged fifty-five, entered the Barnard Free Skin and Cancer Hospital on May 2, 1917, with an inoperable carcinoma of the cervix. Six months previously she had been at the City Hospital where the condition was considered inoperable and an excochleation was done December 8, 1916. Since this operation there had been continuous foul-smelling discharge and severe pains in the lower abdomen. Physical examination showed the posterior lip of the cervix gone with induration posteriorly to the rectovaginal septum. Both parametria infiltrated to the pelvic wall. Rectally a hard mass projected into the lumen of the rectum with mucosa still intact. She was excochleated and cauterized on May 4, 1917, May 29, 1917, July 2, 1917, August 3, 1917, and Sept. 6, 1917. This repeated cauterization treatment, in accordance with Lomer's suggestion, was associated with acetone treatment administered three times a week. Aside from a diminished discharge, there was no improvement. From September to November she was receiving daily $1\frac{1}{2}$ grains of morphine hypodermically. In November we began to receive radium emanations through the generosity of the Memorial Hospital of New York for a short period of time, and on November 21st an application of 157 mc. filtered in $\frac{1}{2}$ mm. German silver was made within the crater. On December 17 another application of 217 mc. for nine hours was made with the same filtration in the same location. This totalled 3444 millicurie hours. There was marked retrogression within six weeks. On January 7, 1918, the pain was so much lessened that only an occasional dose of morphine had to be given. Considerable scar tissue was present in the pelvis, so that it was not until April of 1918 that it seemed certain that complete retrogression had occurred. The patient has reported for examination at intervals of three to six months since, in perfect health and without any visible evidence of cancer. She gained 25 pounds in weight. The last examination was made February 24, 1920.

Such a case is but the exception that proves the rule, as our experience in twelve other far advanced cases has lately demonstrated. In all of these women there was profound cachexia and involvement to the pelvic wall; in one case a rectovaginal fistula was already present. Every one of these women died within seven months of the time of their treatment, in two instances within four weeks. Occasional slight temporary improvement was noted, but in most of them pain was rendered worse and fistulae developed sooner.

Dosage.—The question of dosage has been discussed in a somewhat slipshod manner by many writers, who state merely the total mgrhs., without any detail as to filter, duration, and interval of treatment, method of application, etc. I think the complete reports given by Janeway in all his publications have been distinctly worth while. Only by stating all essential points can we expect to evolve an improved technic of treatment. The very small doses using 50 mgrs. of radium for periods of 24 hours and the very large doses running up to 10,000 mgrhs. intravaginally, have been generally abandoned. Doses are given ranging downward from Kehrer 6,000; Heyman 5,500; Bailey 5,000; Schmitz 4,500; to Schauta-Adler 3,500; Bumm 3,000; Seitz-Wintz 3,000; Menge 2,500; Janeway 2,500-3,000; Burnam 2,000 to 8,000 depending on the extent of the lesion. This dosage refers to the first treatment, no matter whether scattered over several applications in the course of the month or given all at one time.

In many instances some additional radiation will later on be required. But more and more the general feeling is that the first treatment is the crux of the matter; we either "make or break," depending upon our success at that time. There is not as much difference as one would think between the smaller doses of Janeway of 2,500 and those of Heyman of 5,500, for Heyman gave his treatment with a heavy filtration of 3 mm. lead in addition to 0.3 mm. silver, whereas Janeway imbedded bare emanation needles of low power up to 20-23 mc. in value into the tumor mass itself. Although in ordinary calculation the dosage of Heyman would be twice that of Janeway, it is probable that the total radium rays absorbed by the tissues was greater in Janeway's form of treatment, including as it did the hard beta rays as well as all the gamma rays, than in Heyman's, which permitted only a portion of the gamma rays to escape. This question of filtration is one of vital importance and one concerning which there is still considerable difference of opinion. If we wish to get superficial wound healing with but little primary local irritation, there is no doubt in my mind that the very heavy filtration is to be preferred. But our problem is more complex than that. We want to produce deep destruction of cancer with least irritation of the normal tissue. The best filter for this purpose is the growth itself. Heavy filters are too bulky and are not needed for this work, since the cauterizing effect of the hard beta rays is here rather to be desired than otherwise. The use of heavily filtered rays intracervically has therefore only disadvantages. We must differentiate, however, between applications made within a cancerous crater, whose walls partly involve the remnants of the posterior vaginal fornix, and a real intracervical treatment. In the former case a heavy unfiltered dose may lead to profound rectal irritation and even a fistula, for the vaginal wall is sensitive to such beta rays. My own feeling in the matter is that heavy gamma radiation on the first treatment may not show any bad results at the time, may in fact be followed by marked retrogression, but that it has a greater tendency to produce fibrosis and obliterative endarteritis, so that when a second or third treatment is given, the normal tissues are more liable to that profound necrosis which we all have learned to dread as the most serious complication of radium treatment.

As to the interval of treatment, I am more and more inclined to make this a matter of months than of weeks. Since without exception it practically takes at least six weeks for the tissues to show the full result of a heavy radium treatment, all applications within the first four weeks should be considered as one treatment. Thus Heyman, of Stockholm, whose results are in many ways very good, made three applications, the second one a week after the first, and the third at the end of four weeks, the total dosage being about 5,500 mgrhs. He calls this three treatments, but since the therapeutic effect was cumulative over a single period of eight weeks, it should be more properly considered as one treatment. Thus far it would seem that the best results are obtained by attempting to effect a cure in the first treatment period. Occasionally one or two additional treatments are necessary, but where this is the case, the prognosis is much worse. In fact, my own experience corresponds with that of Heyman and Janeway who found that when, after apparently complete retrogression the cancer again showed renewed growth, it could only

in the rarest instances be checked, no matter what treatment was given. In a large number of patients such added treatment actually did harm.

The question as to the point of application and manner of application also needs careful consideration. Intracervical applications are essential for success in the first treatment. I cannot agree with those who wish to melt away a cauliflower growth with radium, for this implies an intravaginal treatment, and the vagina is far more sensitive to radium than the cervix. The mass should be scooped away in the usual manner with a spoon curette, at least sufficiently to leave a small crater or pocket in the cervix in which the radium can be deposited. Occasionally in flat hard growths the radium, divided into several capsules or emanation-tubes, can be placed close against the growth by means of a dental compound applicator or paraffin coated lead mold. In all cases, however, either a needle or a small, $\frac{1}{2}$ mm. silver capsule should be placed high up in the cervical canal so that it lies in part above the apparent extent of the growth and shoots its rays from above downward. As to the use of the Bailey bomb method, I think its preeminent value consists in its attack on the parametrium. I see only disadvantage in its effect upon the cervix itself, for the closer the applicator in this case, the better the effect, and the bomb cannot get as close as other forms of applicators. I take it that a well-directed cervical or cervicovaginal treatment of 2,500 mgrhs. will in most instances annihilate the cancerous deposits in that first group of lymph nodes lying close to the ureter, but further out in the parametrium we need a more penetrating dose. For this purpose the bomb with its heavy dosage for a short period of time, its distance of 1 to $1\frac{1}{2}$ cm. from the vaginal wall and its sheltering filter from all sides except the point aimed at is the ideal applicator. I only wish we might possess sufficient emanation to utilize it. In the meantime a massive x-ray dose can serve as a fairly good substitute in all except the very fat women. Rectal applications to effect the parametrium have been unsatisfactory in my hands. In eight cases in which I have employed them the irritation produced has been intense, no matter how heavy the filter, with very slight effect on the tumor itself. In the diffuse filtrations of the vesico-vaginal septum, distance applications, well filtered as suggested by Burnam have given good results. In vaginal cancers of the flat infiltrating type the use of Janeway's dental compound mold is a great help in accuracy and closeness of application. It is of great importance, as Kelly and Burnam state, to have the patient assume the knee-chest position for the radium application, at least where there is no absolute fixation of the uterus. In this position the cervix falls away from the rectum and by a properly placed gauze pack, in addition to a lead or gold filter, the very painful rectal tenesmus following radium treatment can be reduced to a minimum.

To summarize my technic I advise in cervical cancer of the inoperable stage an intracervical application of 125 mgrs., 25-50 mgrs. of which in the form of a steel needle or $\frac{1}{2}$ mm. silver capsule is placed high up the cervical canal and the remaining 75-100 in silver capsules packed against the cervical ulcer in accordance with its size and shape. The vagina and rectum are protected by a paraffin covered lead shield 2-3 mm. thick, and gauze used to immobilize the application. The application should last for 20-22 hours, a total

of 2,500-2,750 mgrhs. Two weeks later a massive x-ray dose over 6-8 "portals" should be given. The second treatment should be given only in case the retrogression is not complete after 8 weeks have elapsed. Then a small dose of 1,800-2,000 mgrhs. filtered with silver and 1 mm. of brass should usually be given as high as possible in the vaginal fornix. The cervix is usually obliterated at this time.

Where emanations in large quantity are accessible, the most logical method would seem to be the use of 20 mc. bare emanation tubes buried in the cervix, a total dosage of 2,640 mgrhs. when fully absorbed in about three to four weeks. At the same time a well filtered application of 1,000 millicuries in the Bailey bomb is made for one hour to each parametrium and either x-ray or radium abdominally and sacally. The use of emanation in this way may give somewhat better results, but the many cures reported by Clark, Ransohoff, Bumm, Flatau and others sufficiently disprove Bailey's statement that the possessor of 100-200 mgrs. of radium had better content himself with mere palliative measures in the treatment of cancer.

Among the serious sequelæ of radium treatment, septic infection demands first consideration. Curtis recently reported a case of this kind, and we have probably all seen varying degrees of pelvic peritonitis following radium treatment. Such infections would seem to be rather the result of the radium reaction upon a previously infected uterus or tube, than an infection due to the introduction of the radium itself. We also see frequent infections of the urinary tract. In fact, the so-called "radium fever" coming on between the third and seventh day after application is usually due to this cause. Where the fever persists, I have often found a pyelitis the responsible factor. In one such case all pelvic pains and fever were promptly relieved after catheterization of the ureters with instillation of silver solution.

Severe hemorrhage occurred in eight cases as a result of radium necrosis affecting a branch of the uterine artery. In all of these cases a gauze pack was required to control the bleeding. The bleeding was much more profuse than in the untreated cancer cases, but since such blood loss occurred only once or twice at long intervals, the resulting anemia was not as severe as in the untreated cancers with continued dribbling of blood for months.

Most annoying of all radium complications are the fistulas, more especially the rectovaginal ones. Clark at last year's meeting of the American Gynecological Society, stated that in his experience radium treatment actually decreased the frequency of vesicovaginal and rectovaginal fistulas in unrestrained carcinoma of the cervix. I think a closer analysis would have shown that, while radium probably to a degree decreased the frequency of vesicovaginal fistulas, it at the same time increased the number of rectovaginal ones. The reason for this probably lies in the greater proximity of the cervix to the bladder and its markedly favorable reaction to radium treatment as compared with the vagina. Before we began radium treatment at the Skin and Cancer Hospital we saw in the far advanced cases about five vesical fistulas to one rectal fistula. After radium treatment was begun, the proportion was almost reversed. In our group of 86 cases, nine developed rectovaginal fistulas, and in two there was in addition a vesicovaginal fistula.

I am excluding from this number three cases in which a urinary fistula followed as a result of a hysterectomy. In analyzing the rectovaginal cases I found that only in one instance did the fistula follow a lightly filtered treatment; twice the fistula appeared in cases that had received both light and heavy filtered treatments, and in the remaining six instances the fistulas appeared in cases where the treatments were all heavily filtered. In two of these nine cases only one or two radium applications were made and in both of these the fistula did not appear until four months or more after the last application and just previous to the death of the patient. These fistulas were therefore probably primarily due to the disease itself. In the remaining seven cases, from three to five treatments heavy filtered at intervals of two to four months were given. It is this repeated gamma radiation, even in moderate dosage, that leads so often to this complication. Another harmful factor that Weibel has justly emphasized is the combination of previous hysterectomy and radium. Weibel found marked rectal tenesmus and occasional fistulas following prophylactic vaginal radiation after hysterectomy, and hence advised against it. One of the rectovaginal fistulas developed after a second radium application following hysterectomy. Doubtless the diminished blood supply of the vagina after hysterectomy renders it more liable to radium necrosis.

In some of the cases with marked rectal tenesmus and stricture formation, the fistula comes rather as a relief than otherwise. Both Burnam and Bailey have noted this point and found temporary improvement following the breaking through of the rectovaginal wall. With this in view and having had similar experiences, I recently did a colostomy on a patient whose rectum was almost occluded by fibrous infiltration. Considerable improvement was noted following this procedure and I think it is worthy of further trial in these troublesome cases.

VAGINAL AND VULVAR CANCER

Six primary vaginal cancers and six vulvar cancers were treated with radium. Only one of the vaginal cases is free from recurrence; three are dead; one recurred, and one was not traced. In the vaginal cancers, however, the result of operation in even the very earliest cases is so bad that radium is rightly to be preferred. Carcinoma of the vulva, on the other hand, is most unsuited for radium treatment. The radium reaction on account of the free nerve supply in this region produces severe and prolonged burning and pain. The local retrogressions are slow and incomplete and the glandular metastases which occur so uniformly in this form of cancer seem to appear earlier and grow more rapidly where radium has been used. Only one of our six cases is at present alive and in that case excision of the vulva and tributary glands was combined with the use of radium. Unquestionably surgical measures will give better result, although an occasional cure, as in Janeway's case, may be found, where radium alone is used.

Primary cancer of the body of the uterus, if operable, we have always treated by hysterectomy in preference to radium. In one of our inoperable radium cases it seemed possible that the tumor sprang from the uterine body, though the cervix was also involved. No improvement was noted in this patient.

OPERATIVE CASES

Operation in the form of a more or less radical hysterectomy was associated with radium treatment in fifteen cases of our series. In seven of them a typical Wertheim operation was done, followed by a prophylactic radium treatment. Three of these seven had a recurrence in the following year that required additional radium treatment. In three other cases the cancer was found to be too extensive to permit of a complete Wertheim operation. The remaining five were borderline cases rendered operable by rapid retrogression following radium treatment. There was no operative mortality in this series of fifteen cases. Of special interest are the findings in the five uteri that were removed after partial or apparently complete retrogression following radiation. In four of them about 1-3 cubic cms. of cancerous tumor tissue was still present within the cervix. These cases had received a dosage of 2,200; 2,400; 2,200; and 3,200 mgrhs. respectively from 1 to 4 months before hysterectomy. In the fifth case a dose of 2,520 mgrhs. was given intracervically. Although in this case the cancer was completely eradicated from the uterus, an enlarged iliac lymph-node removed at operation showed malignant involvement.

My experience with early operable cancer of the cervix treated only with radium is limited to one case that remains clinically cured for a period of 22 months. The contraindication to operation in this case was a high blood-pressure, nephritis and obesity. The arguments of Janeway, Ransdhoff and Flatau in favor of radium in all of these early cases do not appeal to me. The two first named talk of an operative mortality of 20 to 25 per cent following the Wertheim operation, but leave out of count entirely that this is not the mortality where the operation is limited to early cases. Kelly did not lose a case in 20 such early cancers removed by operation. In my own series there was no mortality. At the most, a mortality of 5 per cent could be held against radical operation in the early operative group. The proportion of complications and fistulas would also be greatly reduced under these limitations. Bumm's statistics are most impressive. He reported in January, 1919, that out of 77 operable cases of cancer of the cervix treated in 1913 and 1914 with radium, 17 remained cured for five years, whereas out of 203 similar cases operated between 1911 to 1913, 77 remained cured in 1919 making a proportion of 22 per cent cured with radium, and 37 per cent cured by operation. While both these percentages are higher than those obtained in other clinics, they tend to show that under similar conditions operation is still attended with a greater likelihood of permanent relief in the early cases. Until an improved technic of radium treatment has changed this proportion of favorable results, I think we should be very cautious in recommending the use of radium in early operable cancer of the cervix.

I am, however, inclined to share Bailey's views against operative removal of the uterus where radium has produced sufficient retrogression to make such a procedure possible. Out of my five cases, two are already dead, one has cancer in the glands, and two are for the present free from recurrence. Even in the absence of any operative mortality, not enough is gained to justify such a procedure. With Kelly I now believe we should limit our operative work to the evidently favorable group of early cases.

SUMMARY

1. Radium treatment of uterine cancer should be kept in the hands of the gynecologist rather than the roentgenologist, but such a gynecologist should seek preliminary training in the use of radium and must have continued opportunity for observation and treatment of cancer cases in order to reduce mistakes to a minimum.

2. Good permanent results can be obtained in a certain proportion of cervical cancers with amounts of radium not exceeding 100-150 mgrs. of the element, though the use of large amounts in the form of emanation will doubtless decrease complications and increase the number of cures to some degree.

3. If possible, all necessary treatment should be given within the first six to eight week period before sclerosis has set in and rendered the cancer less accessible and the normal tissues more susceptible to injury.

4. Tumor filtration or light metal filtration together with intracervical application does most good and least damage; 2,500-3,500 mgrhs. are usually enough to give results in the favorable cases.

5. In the absence of the Bailey bomb and large amounts of emanation, well directed and prolonged x-ray from 6-8 portals will usually affect the parametrial and glandular involvements.

6. Prolonged necrosis and fistulas are due to repeated treatments, to vaginal applications and to heavy gamma radiation or to a combination of the three.

7. Rectovaginal fistulas are more frequent and vesicovaginal fistulas less frequent after radium treatment.

8. Operation is to be preferred in *all* operable cases under 35 years and in the early operable cases beyond this age. Radium is to be recommended wherever obesity, lung, heart, or kidney lesion, makes operation difficult or dangerous, and in advanced operable, borderline and inoperable, but not in the advanced inoperable group with cachexia.

These are, of course, not conclusions, but merely estimates based upon an analysis of the results thus far obtained. Under improved methods of treatment and wider experience they will doubtless be materially changed.

3519 WASHINGTON AVENUE.

(For discussion, see p. 195.)

OPERATION OR RADIUM FOR OPERABLE CASES OF CERVICAL CANCER?*

BY WILLIAM P. GRAVES, M.D., F.A.C.S., BOSTON, MASS.

THE question of whether to operate for operable cancer of the cervix is at the present moment offering to the science of gynecology a new and enlivening problem. Fortunately it is one that requires for its solution only sufficient time in which to secure an adequate comparison of final results between operated cases and those which under similar conditions have received radium treatment. At the present time such a comparison is necessarily incomplete. In most clinics, as in our own, for example, the radium treatment has been applied only to inoperable and borderline cases, and it is but recently that a certain few experienced surgeons have discarded operative measures entirely and are treating with radium cases that are frankly operable. The final solution of the problem must therefore await conclusive evidence from the work of these pioneers. We must also take into account the fact that radium in sufficient quantities to afford successful treatment for cancer of the cervix is possessed in only a few localities, and that even in the best equipped radium institutions the questions of dosage and technical methods of application are still very much in the experimental stage. During the period required for a more general distribution of radium and the development of technical knowledge in its use, it is incumbent on those who are seeing many cases of cancer of the cervix to view the problem of treatment from an unprejudiced standpoint, and to contribute from their own experience whatever facts may be of general value.

The present paper is a personal accounting of stock, by one who with an average amount of operative experience and possessed of a moderate quantity of radium, has had an opportunity of comparing, to some extent, the results of both methods of treatment.

In order to make as complete a review as possible, I have combined the analysis of my own cases of cancer of the cervix with those of my associate, Dr. F. A. Pemberton, whose percentages in results, so far as they may be compared, have been almost identical with my own. Many of the details of the analysis I shall defer for another paper and shall here mention only those figures which are of especial interest for the subject in hand. The list of cases comprises those seen and treated by Dr. Pemberton and myself, at the Free Hospital and in our respective private practices. The period of observation extends from the present time back to the date of my first radical operation for cervical cancer eleven years ago.

Our first inquiry in the analysis of these figures must be directed toward the question of the actual value of radical operative methods. Especially is this necessary in view of the rather seathing criticism to which the surgical

*Read at the Forty-Fifth Annual Meeting of the American Gynecological Society, Chicago, May 24-26, 1920.

operation of cervical cancer is at the present time being subjected by certain of the more progressive of the radium enthusiasts. Thus we are told that the radical operation is too difficult for practical use by the great body of surgeons and should be attempted by only a few skilled specialists. The disadvantages of the Wertheim operation are described in the following quotation from a widely read author.

"In these days of low mortality percentages attending nearly all major operation, no operation can possibly gain headway which combines with it a shockingly high mortality and large majority of distressing and desperate sequelæ. The effect on the lay mind must be taken into consideration, for while one may have over 50 per cent of ultimate cures among those patients that survive the operation, the effect on the average intelligent citizen is abhorrent, if for this number of survivors there have been twenty-five deaths, and for the other twenty-five a wretched existence attended by repulsive postoperative sequellæ, followed by a painful and lingering death."

In other words the operation is being condemned for its low percentage of operability and curability, its high immediate mortality and the large percentage of its postoperative sequellæ. To us these criticisms seem overdrawn and we have made this first statistical review of our cases with a particular interest in establishing the truth regarding these points.

Of first importance in any statistical report on the subject is the question of operability. The variation in operability percentages given by different surgeons is very great. In general the figures in this country are lower than those from abroad especially in Germany. Thus, Clark found only about 20 per cent of his cases operable. Taussig gives 25 per cent. Jacobson in a review of the work of 18 surgeons estimates a combined operability of 46.2 per cent; Wilson in England gives 32 per cent; Wertheim gives 50 per cent. Other higher figures are Berkeley, 63 per cent; Aulhorn, 65 per cent; Favre, 70.8 per cent; and Busse in Krönig's Clinic, 78.9 per cent. It is to be regretted that some of the most prominent of American surgeons have omitted operability figures in their statistical reports. In our work we have seen 181 cases, of which number 114 have been subjected to radical operation by the abdominal route. Subtracting three cases which refused operation, our operability percentage amounts to 64, a comparatively high figure.

The question of operability, undoubtedly depends to a certain extent on the state of public education in a given community both with regard to the laity and the profession and it is quite possible that this factor accounts to some extent for the higher rate of operable cases seen in the clinics of Germany, where a systematic propaganda of public instruction in malignant disease has been carried on for many years. On the other hand, in this country a very wide divergence in operability often appears in different clinics of the same community. We may therefore conclude that the estimate of operability depends to some extent on the individual judgment of the attending surgeon.

There is no doubt that the nature of the institution is an important factor in operability percentages. Thus in a large cancer institute a greater percentage of hopeless cases would probably be seen than in a smaller surgical hospital like the Free Hospital for Women.

In our choice of cases for radical treatment we have always been influenced by a firmly grounded conviction of the value of operation both as a curative and as a remedial measure, and it has been our policy to give to our cancer patients every possible chance either for a cure of the disease, or for a reasonably comfortable prolongation of life. We have therefore made it a practice to operate on every case in which there is a fighting chance to remove the disease without killing the patient or causing permanent injury to the hollow organs of the pelvis.

The next important point in the consideration of the surgical treatment of cervical cancer is the matter of operative mortality. In our series of 114 cases there have been six deaths resulting from the operation, or 5.2 per cent primary mortality. In view of the relatively high percentage of operability, this mortality figure is satisfactorily low. As has been the case with other operators, most of the deaths were the result of unfamiliarity with the technic of the operation. Dr. Pemberton lost his first case, but has had no other deaths in his list of nineteen operations. The other five deaths belong to the writer in his series of 95 operations. With the exception of one case of pulmonary embolism in 1919, these deaths occurred during the period of surgical inexperience.

Our low mortality record we do not ascribe to any special operative skill, but rather to the exercise of a certain amount of common sense in the performance of the operations. In the great majority of our cases (99), the Wertheim technic has been employed, but after a few unhappy experiences we came to realize that in certain unfavorable cases the attempt to secure a wide dissection of the parametrial and paravaginal tissue is attended with too great danger of uncontrollable hemorrhage or permanent injury to the ureters or bladder to make it feasible. Under such conditions in several cases (15 in all) a short cut has been taken across the parametrium close to the cervix and vagina in the manner of a complete hysterectomy. The occasion for this more conservative method of extirpation has occurred when a dense unyielding parametrium has been encountered, the result of a long standing parametritis, or of a too drastic preoperative treatment with radium. In some cases it was employed in very fat patients, with inaccessible uteri fixed deep in the pelvis. Occasionally the Wertheim technic was carried out on one side of the pelvis and the short cut taken on the other. Special effort has been made to avoid sepsis and hemorrhage, the chief causes of immediate mortality. In the majority of our cases the cancerous mass has been curetted and cauterized a week or ten days before operation, during which time the vagina is treated with formalin applications. The reduction of the cervical mass greatly facilitates the dissection of the parametria, while the antiseptic treatment of the vagina, reduces to a minimum the chances of infecting the peritoneal cavity during the vaginal amputation. For the control of hemorrhage we have not found it necessary to tie the internal iliac arteries, but have pursued the "tie as you go" principle. This method keeps the operative field clear of obstructing clamps and enables the operator at all times to be master of the situation. As a consequence, postoperative shock has been an infrequent occurrence.

It has been our studied policy to avoid leaving the patient in a condition of worse suffering than she would have had without the operation. Thus in no case has there been an injury of the ureters, and in only one case has there resulted a vesical fistula from injury to the bladder. One patient had a rectovaginal fistula, resulting from a gauze pack in the pelvis, inserted to control a difficult hemorrhage. Aside from these two cases, the only fistulae that we have had in our series have resulted from the overzealous prophylactic applications of radium following operation. In fact we are able to state with considerable emphasis that in our experience the "wretched existence attended by repulsive postoperative sequellæ" described by Dr. Ransohoff, is much more likely to result from radium treatment than from a radical operation performed with rational conservatism.

Of course the supreme test that shall decide the choice of treatment must rest finally upon the question of permanent cure. It is customary to compute the end results of the radical operation for cervical cancer on the basis of the so-called five-year curability test. Although we all know that a patient living and well and without palpable recurrence at the end of five years is not always permanently cured, nevertheless for the sake of comparison we must adopt this arbitrary time limit as our standard measure. In estimating the five-year curability in our operative cases we find that it amounts to a figure ranging between 27.6 per cent and 34.2 per cent according to the particular formula used in computation. This relative curability percentage compares sufficiently well with the figures of Jacobson who gives a combined result of 23.4 per cent for 18 American surgeons. It, however, is disappointingly small when contrasted with the figures of Wertheim with 42.5 per cent, Peterson with 47.3 per cent, and recently Cobb with 57.1 per cent. It is interesting to note that there are in this series six patients alive and well who have not quite completed the five-year period of curability. If this paper were to be written a few months later the proportion of relative curability would be distinctly improved. The following is an abstract of the full statistical report of our cases compiled by Dr. J. C. Janney.

| | |
|--|-------------|
| Total cases seen | 181 |
| Refused operation | 3 |
| Cases operated on—Dr. Graves..... | 95 |
| Dr. Pemberton..... | 19 |
| Total cases operated on | 114 |
| Operability | 64% |
| Operative deaths | 6 |
| Operative mortality | 5.2% |
| Relative curability—5 years..... | 27.6%—34.2% |
| Absolute curability | 16.8%—18.5% |
| (According to formula of computation.) | |
| Type of Operation | |
| Wertheim | 99 |
| Complete hysterectomy..... | 15 |

We must now direct attention to our results with the use of radium and inquire whether there has been in these results any justification for giving up the radical operation for operable cases.

Our earlier observations of the radium treatment were made in conjunction with the Huntington Hospital, at that time under the clinical direction of Dr. Thomas Ordway and were later carried on at the Free Hospital for Women after the acquisition of 100 milligrams of radium salts in the usual divided amounts. In addition to the treatment of inoperable cases, an endeavor was made to employ radium as an adjuvant to radical surgery in operable cases. A number of borderline cases received intensive radiation, and were then subjected to radical operation. Three of these consecutively operated on a few days after the last radium application, developed an acute postoperative pelvic peritonitis from which one patient died. As these were the only instances of peritonitis in the series, and as all the conditions were similar in the three cases, it seems probable that the radium devitalized the normal tissues in some way so as to leave them nonresistant to infection. After this experience the operation was postponed for at least three or four weeks after the last radium treatment, as recommended by Wertheim. No more serious sepsis was encountered. In all of the cases, however, which had received several radium treatments, the parametrium was sclerotic and devoid of the usual plains of cleavage. It was in cases of this kind, wherein it was found impossible or at least inadvisable to carry out the Wertheim technic of isolation of the ureters and wide dissection of the parametria. More recent experience has shown us that a single moderate dosage of radium does not sclerose the parametrial tissue and thus prevent the extended operation. In frankly operable cases, however, we are not convinced of the value of a preoperative treatment of radium.

A second method of using radium as an aid to the radical operation, is its application as a prophylactic after operation. A number of cases were thus treated in the earlier experimental days of radium and an uncomfortably large percentage of them developed fistulae after a lapse of several weeks or months. Here again there is no doubt that the radium was injudiciously applied and that with a proper technic, most of these fistulae might have been avoided. On the other hand it must be granted that the short vaginal pouch left after a radical operation with its thin atrophic wall, offers a feeble resistance to radiation and is susceptible to burns even when the radium is most skillfully applied.

We have therefore given up the prophylactic use of radium after radical operation in which a satisfactory extirpation of the disease has been attained. In other words in a case favorable for operation we no longer use radium either before or after the operation.

On the other hand when the specimen removed at operation shows that the extirpation has been incomplete, radium is applied as soon as the vaginal wound is healed. Three cases treated in this manner about a year ago have not yet shown palpable recurrence.¹

In the treatment of postoperative local recurrence we have found radium invaluable, though here again in some of our earlier cases we had trouble with fistulae. In several instances the disease disappeared for astonishingly

¹Note: Since the paper was read, one of these patients developed a recurrence.

long periods of time and in one case we think we have effected a cure. This patient was operated on in 1909, for well-advanced cancer of the cervix. She remained well for five years when she had a local recurrence in the vagina, as proved by microscopic examination. Under radiation at the Huntington Hospital the recurrence promptly disappeared, and the patient is now, six years after the radium treatment, and eleven years after the radical operation, perfectly well.

In our treatment of inoperable cancer of the cervix we have had many brilliant temporary results and many disappointments. We have at present in our series a number of so-called "clinically cured" patients, but our previous experience does not warrant us in regarding any of these cases as permanently cured with the one exception mentioned above. It must be granted, however, that as our operability standard is exceptionally high, the cases assigned for radium treatment are necessarily of a rather hopeless type and that we have not given radium an entirely fair trial.

In the general review of our work it will be seen that we do not feel the same degree of discouragement with regard to operative treatment as is expressed by some surgeons in recent literature. On the other hand radium in our hands, though it has been invaluable as a palliative, has proved disappointing as a curative agent and we have not yet felt justified in substituting it for operation in a favorable case.

This conclusion, it must be repeated, is formed entirely from personal experience and does not accord fully with the views of others. Our next inquiry must therefore be whether our comparative failure in the use of radium is not due to inadequate methods of application rather than to any fault of the agent itself.

The question has been readily answered. I was fortunate enough to be present at the important radium conference held at the Memorial Hospital of New York in March of this year, and had the opportunity of seeing and examining many of Dr. Bailey's cervical cancer cases. It was entirely obvious to me that Dr. Bailey's results are far better than our own, both as regards palliation and permanent curability. This superiority in results must be ascribed to a greater knowledge and experience in the use of radium, to the possession of large quantities of radium element, and to the elaborate and efficient technic of application. The conclusion from our personal results should therefore not be generalized.

Granting that cervical cancer is curable by radium, and that when properly applied in frankly operable cases, radium may be surer and safer than radical operation, a possibility that is by no means remote, are we then to give up the operation in favor of radium? The question must be answered according to the surgeon's individual facilities. In our own case with a fair operative experience, but inadequately equipped with radium and its necessary appurtenances, we are undoubtedly doing our best for our patients by continuing to operate on operable cases.

THE EQUIPMENT, THE ORGANIZATION, AND THE SCOPE OF TEACHING IN THE OBSTETRIC DEPARTMENT OF A MODERN MEDICAL SCHOOL*

BY BARTON COOKE HIRST, M.D., F.A.C.S., PHILADELPHIA, PA.

IT is a noteworthy fact that the revolutionary changes in the teaching and practice of obstetrics in the United States during the past twenty years has received little attention from this Society. In the forty-four volumes of its transactions, among the many papers presented at the annual meetings, I remember but one that dealt with the improved training of young physicians who will be our successors. Has not the Society thus lost an opportunity for leadership which would have added to its prestige and influence?

The trustees of medical schools, advisory committees, state legislatures and boards, naturally turning to the leading national society for advice and information, must have been astounded at its aridity in this field. The writer's endeavor in this communication is to make a tardy amend for the neglect of a question which, it would seem, might have excited interest and received careful consideration long ago.

There are medical schools still undergoing reorganization under private control. Legislatures must give this matter thought in organizing the increasing number of schools supported by the state, the expense of technical education often making private management impracticable. It is in the hope of furnishing information for the governing bodies of such institutions and to give aid and support to the teachers who are ambitious to have their departments as nearly as possible on an ideal basis, that the following propositions are advanced. In a medical school designed for about 400 students in a four years' course, the equipment of an obstetric department which entitles it to a respectable position must consist: (1) Of a hospital of at least 100 beds, with a clinical amphitheatre, a separate operating room for septic cases, and an isolated space for infected women. The apportionment of beds should exceed that for surgery or medicine for the average instructive capacity of each case in obstetrics is limited in the majority of instances to one or two students. (2) An ambulatory dispensary for the preliminary study of patients and for the follow-up observation and treatment of all cases after discharge from the hospital. Such a dispensary accumulates in time a large service, illustrating the pathologic sequelæ of parturition, including practically all the diseases of women. It should be equipped with every appliance, including electrical, for treating women, and should have a social service department attached. (3) An outpatient department, with the necessary personnel of nurses, physicians, and social service workers. This department should have a separate ambulatory dispensary. On a basis of about 2000 women cared for in their homes annually

*Read by title at the Forty-fifth Annual Meeting of The American Gynecological Society, Chicago, May 24-26, 1920.

an enormous attendance can be secured of women awaiting delivery and, by a follow-up system, of women suffering from any of the complications or sequelæ of the process of generation at any stage. This service is a valuable feeder to the central hospital, to which all cases requiring operative or other hospital treatment are referred.

It is evident that such an organization gives the obstetric department an amount of clinical material in all the conditions peculiar to women that no other department can rival or even approach. What is more important, every therapeutic measure required by women can be shown to the student; the preventive treatment of gynecologic affections by the proper management of labor; the relationship of diseases of the pelvic organs to the productive function; the effect of operative measures on subsequent childbearing and *vice versa*. In short to any intelligent student the necessity is made obvious of a closely correlated study of all the pathologic and physiologic phenomena of the female generative organs; the effect of the former on fecundity and reproduction and the causative relationship of parturition to the vast majority of woman's diseases.

Such is the broad view of modern education, contrasting strikingly with the provincial American practice of the past; an obstetric department concerned only with the delivery of women without regard to their future and a misnamed gynecologic department dealing only with a moiety of the subject, busily engaged for the most part in patching up the results of other physicians' bad obstetrics. Such an arrangement was evidently doomed to extinction by modern progress and could no more be revived than we could recall to life the elder Mr. Weller. The medical pedagogues of America must agree with their confreres in the rest of the world that the scope of obstetric teaching embraces, not only the physiology and pathology of reproduction, but necessarily all the diseases of women. The chief of an obstetric department must be a thoroughly trained abdominal and pelvic surgeon, maintaining proficiency in his art by constant practice. Otherwise he is not fit for his position and would be incompetent to deal with the cases that may be admitted to his clinic at any moment; ruptured uterus with injury of intestines requiring resection, diaphragmatic hernia in pregnancy, discovery of disease of the gall bladder in the course of an abdominal operation and so on through a long list. In brief, he must be prepared to deal surgically or otherwise with all the ills of women whether complicating pregnancy, labor, and the puerperium, or often their direct consequence.

We have in the University of Pennsylvania a voluntary and a compulsory student's internship in the Maternity. The amount of material he sees, the notes he takes, and his conduct on the service are collated to establish his rating in the final examination. I find this record of a student's clinical opportunities during a voluntary internship of two weeks: Seven normal deliveries; one extraperitoneal Cesarean section; one transverse presentation with version; Cesarean section for placenta previa, compound presentation with two feet, hand, occiput and prolapsed cord; Cesarean section for a monster, dicephalus tetrabrachius; ten plastic operations; two ovarian cysts; one hydrosalpinx; one salpingitis; one exploratory laparotomy; one supravaginal hysterectomy;

one large ovarian cyst; one cancer of the sigmoid—resection; six curettages; three appendectomies; one gas anesthesia; one radium application; two intravenous injections of salt solution; one blood transfusion; two inevitable abortions; one uterine irrigation; one ruptured ectopic gestation. This same individual had another compulsory week's internship in the hospital, a two weeks' voluntary service in the out-patient department, and another compulsory 10-day period, a year of theoretical lectures; another year of clinics, conferences, section work and ward classes in which he saw, heard described, and personally assisted in the treatment of a large additional number of cases such as have been detailed.

The following question naturally suggests itself. If the chief of an obstetric department must be an accomplished pelvic and abdominal surgeon, if his department properly organized and conducted controls an amount of clinical material that no other can rival, if he alone in the medical faculty can teach *all* the conditions which the physician must treat in women, is it pedagogically or economically justifiable to maintain in a medical school a so-called gynecologic department which can only duplicate the teaching of the surgical and obstetric departments and in a manner necessarily inferior to both? This question has already been answered in the only way it could be answered, by the majority of our best medical schools. It is being similarly answered today as opportunity occurs by vacancies in existing chairs, and it will presently be answered conclusively and finally. As an interested observer, an occasional participant in the transactions, and an old member of this Society, it appears to me impolitic to allow a movement which vitally concerns us all to gain irresistible headway and to reach its ultimate goal, apparently ignored by the very organization that should foster and direct it. The reason for our past attitude is obvious. Some of the members occupying positions which are now anomalous and anachronistic would perhaps feel hurt by this discussion. Others, disinterested, might, in the spirit of a *laudator temporis acti*, be honestly convinced that the old order should not be disturbed. But the issue is too important to be influenced by self interest or unprogressive minds. This is the only country in the world now rich enough adequately to equip its medical schools; consequently the hegemony of the medical education of the world lies within our grasp, if, having the money, we have the wit to seize it. Apparently the world's center of wealth, power, and civilization, shifting with the ages from Mesopotamia, Egypt, Greece, Rome, and Northern Europe, is moving to this continent. It is an inspiring thought that each one of us puny mortals in his tiny sphere may play a part in such a stupendous cosmic drama. Let us teachers of one of the most important medical branches put our house in order, that we may merit a place among those who assist and do not hinder the passage to America of the world's leadership in medical education.

GYNECOLOGIC PROBLEMS IN INDUSTRIAL MEDICINE*

BY HARRY E. MOCK, M.D., F.A.C.S., CHICAGO, ILL.

THE noted gynecologist, Howard Kelly, in 1908 pointed out the inhuman and intolerable conditions under which most working girls were forced to labor. He stated "their conditions are so bad as to be absolutely defenseless from social and economic reasons irrespective of health, and reform will come, though perhaps slowly, that will make it impossible to exploit the work of a girl who has not reached the age of puberty." He classified ill effects upon the health of all working women as due to their external conditions:

1. "Long confinement indoors in superheated, badly ventilated, dirty rooms.

2. "Work permitting little change of posture and enforcing either long continued sitting or standing.

3. "Contact with unhealthy work companions suffering from tuberculosis or other infectious diseases."

These conditions existed not only for the factory girl, but for the clerks in stores and the teachers in schools. Kelly said: "The remedy for these conditions will never be effective until all places of employment for women are under rigid inspection of a competent health department with power to enforce sanitary conditions."

"Reform of these intolerable conditions" was a prophecy in 1908 that has been largely fulfilled during the last decade and to the glory of the medical profession can much of the praise for this accomplishment be attributed. Medico-sociologic problems are being considered more and more by great scientific gatherings, demonstrating that the profession is awake to its broad duty of conserving the nation's man-power, as well as to the problems of disease in the individual.

The last ten years have witnessed the birth in our profession of a new specialty known as industrial medicine and surgery. From the old time company surgeon, content with the bandaging of cuts and the anointing of bruises, there has evolved a new type of physician in industry concerned with the whole problem of human maintenance. Before entering upon a discussion of the gynecologic problems which present themselves to a department dealing with human maintenance, it is desirable to give a brief outline of what is included in industrial medicine and surgery as applied to the individual industry.

In an industry employing hundreds or thousands of people, a veritable human laboratory is furnished the physician where he can study correlated problems of medicine, sociology, and economics. He soon develops the habit of interpreting his findings in terms of the economic end-result—instead of awaiting the development of disease or injuries in order to apply his curative methods. He

*Read by invitation at the Forty-Fifth Annual Meeting of the American Gynecological Society, Chicago, May 24-26, 1920.

forms habits of studying the prevention of diseases and accidents. In time a competent health department is developed in the industry which includes the following activities:

I. THE PREVENTION OF DISEASE AND ACCIDENTS

- (a) By a study of the nature of the work and the discovery of possibilities for occupational diseases and methods of preventing the same.
- (b) By safety methods, educational campaigns and a "follow-up" of every injury cause in order to prevent new accidents or recurrences of accidents.
- (c) By industrial sanitation: improving the working home, removal of dust, gases, etc.; ventilation, illumination, proper eating places, sewerage and garbage disposal, cleaning, care of toilets and cuspidors and numerous other sanitary measures.
- (d) By a study of the physical conditions of the employees themselves and their relation to occupation to discover possibilities for breakdowns due to misfits; or due to fatigue poisoning; or potential causes for accidents within their bodies; or possibilities of spreading diseases to fellow employees.

II. THE SUPERVISION OF THE HEALTH OF EMPLOYEES

- (a) By physical examination of all applicants for work in order to place employees on jobs according to this formula: Physical qualifications plus occupational qualifications equal the job; and again to eliminate those applicants who cannot be employed "with safety to themselves, to others or to property."
- (b) By physical examination of old employees at stated intervals or wherever indicated—one of the best means of coming into personal contact with each worker.
- (c) By health talks to individuals and to groups; and by personal advice bearing on each particular case.
- (d) By developing proper habits of exercise, bathing, diet, etc., among the employees.

III. ADEQUATE MEDICAL AND SURGICAL CARE

- (a) By supervising the type of medical care received from outside physicians.
- (b) By furnishing proper medical care in certain types of cases.
- (c) By furnishing the best surgical service to all injured employees.

IV. NURSING SERVICE

- (a) By furnishing trained nurses to assist the plant physician and often to render certain forms of first aid.
- (b) By nurses visiting all sick employees: to see if proper care is being received, to assist by certain nursing duties, and otherwise show the friendly interest of the employer in the sick employee.

Ten years ago only a few of the larger corporations had installed medical services. The number gradually increased until in 1916 it was possible to organize the American Association of Industrial Physicians and Surgeons composed of 150 members, physicians who were pioneering in this field of conserving and reclaiming the man-power in the industrial army.

Then came the war and with it the very rapid development of this new specialty. It is wrong, however, to speak of it as a new specialty, for industrial medicine is only the application of old principles of prevention and curative therapy to large groups of people. But the cry for more and more production in the essential industries caused many of them to install medical departments in order to maintain their working forces. The adoption of many of the principles of industrial medicine by the army and their further development, with the opportunity of observing their worth when applied to hundreds of thousands of men, resulted in establishing industrial medicine and surgery upon a firm foundation.

Today at least 400 industrial concerns have adopted a more comprehensive medical service than that of a company doctor, whose sole duty is the care of injury cases. At present the American Association of Industrial Physicians and Surgeons has 600 members representing this broader type of physician giving part or all of his time to industrial practice. We have classified 2000 physicians who are doing chiefly industrial work. There are at least 5000 more physicians employed by the accident insurance companies to care for injured workmen. Some of these are doing excellent work, but the majority represent the cheap contract practice which begets cheap service and very poor results.

When you consider that over 30,000,000 of our people are engaged in gainful occupations and that only between six and eight millions of this enormous army are receiving any kind of organized, adequate, preventive and medical service, you gain some conception of the magnitude of the work still confronting the medical profession. It is the patriotic duty of our profession to train well qualified physicians for this industrial practice and to educate employers and insurance companies to use only these qualified physicians in the protection of the lives and limbs of the working forces, for in this way alone can we best contribute to the maintenance of the man-power of the nation.

It is estimated that at least 10,000,000 girls and women are included in this industrial army of 30,000,000 people. Thus it is apparent at once that the diseases and injuries peculiar to women furnish a large proportion of the problems connected with maintaining the human element in industry as an efficient force.

In past years I have received a great many inquiries concerning the type of occupations women should enter. During the war an effort was made to have the Federal Government make a survey in order to classify positions available for women and to arbitrarily decide which of these occupations they could enter and from which they must be barred.

General principles on this subject might be laid down, but the real selection of proper occupations for women can only be made by considering each individual case in relation to her chosen work. In order to do this, every woman worker should receive a careful physical examination and the occupation then chosen according to her physical qualifications. In every case the question of whether she is physically and mentally fit to do the work and whether the occupation will be unduly hazardous for her must be answered.

MEDICAL EXAMINATION OF WOMEN EMPLOYEES

The practicability of examining female employees has been demonstrated in a number of large industries throughout the country. Some of these have employed women physicians and subjected every girl employee to a complete examination from head to foot, while the majority of concerns have given only a partial examination including the head and neck and chest. Careful history taking and questioning usually reveal abdominal or pelvic symptoms which indicate a more thorough examination. Consent of the parent or of some relative should then be obtained before making the pelvic examination and then

it should always be made in the presence of a nurse, and in the case of virgins under nitrous oxide anesthesia. One large industry which for three years completely examined every girl employee found that the number of pathologic conditions discovered by this system were only slightly in excess of those found by the partial examinations in other concerns. They have since discarded the method as it was very distasteful to their girl employees.

The conditions usually found in healthy males by examining below the waist are hernia, venereal disease, hydrocele, varicocele and undescended testicle, varicosities, deformities of the extremities, flat-feet and other foot conditions. Remember most employees examined are apparently healthy and the examination is not made for the purpose of discovering some acute disease. The proportion of these conditions found by examining women below the waist are small compared with men. Hernia is rare in women—even the femoral type which is the commonest form found in this sex.

Dr. Schereschewsky states that he found one hernia in five hundred examinations of female garment workers. In two thousand examinations of girl employees, where the history of the case indicated a more thorough examination, the author found three femoral and one inguinal hernias. In five hundred consecutive examinations in a gynecologic dispensary the author found only five femoral or inguinal hernias whereas umbilical and ventral hernias were common. These were chiefly found in older women who had borne children. Therefore the need of examining female employees for hernia is not sufficient to warrant subjecting them to the naked examination. Questioning as to whether they have a lump or swelling in the groin will usually be answered in the affirmative by a woman employee if a hernia does exist.

Venereal disease is often hard to detect in women. I have been told by the physician in charge of the work in the concern referred to above that the percentage of venereal cases found by their complete examinations were very few. In our clinic we have discovered cases of syphilis among the girl employees, but this was done by the detection of mucous patches in the throat or the rash on the body.

Varicose veins are common among older women or among the married women who apply for work. These do not object to the physician examining their extremities. But the average girl employee has been protected from the type of occupations which have made varicosities more prevalent among the male workers.

Because of the rarity of conditions found below the waist line, influencing woman's fitness for work, most physicians in industry have therefore limited their examinations to the head, neck, and chest.

REST ROOMS

No greater efficiency measure can be installed by an industry than a properly located, adequately equipped rest room, especially where girls and women are employed. In visiting numerous concerns I have found rest rooms provided for the girls, which were located in some dark, out of the way corner or were part of the equipment of the toilet rooms. They were

uninviting and very few girls would use them. Wherever women are employed, clean, airy rest rooms removed from excessive noises should be provided. They should be furnished with single beds, instead of hard cots, with clean pillows and sheets and warm blankets. A nurse or some qualified matron should always be in charge. Screens should separate the beds so as to furnish privacy to each girl. The room should be kept cool and well ventilated. Its very appearance should be restful. It has been my experience that girls with temporary illness are always glad to go to such a rest room, remove only their shoes or perhaps loosen their skirts and corsets and crawl in between the clean sheets and under the warm blankets. The nurse can then bring them a hot water bottle—often a hot drink. After an hour or so these girls usually feel well enough to return to work. Without proper rest rooms these sick girls usually go home, losing the greater portion of the day and often longer because the exertion of going home has made the condition worse.

DRINKING AND TOILET FACILITIES

When employees are engaged on piece work and especially in the case of girls, one often finds that insufficient water is consumed and the requirements of nature are neglected. The girls refuse to lose the money by taking time off for these things.

The only solution for this is that the employer will give ample time, without loss to the employee, to attend to these essentials. Bubbling fountains should be located near the working places and every employee should be thoroughly educated as to the importance of water drinking. No better remedy is at hand for the prevention of fatigue than frequent flushings of the body organs by water.

For every five hundred girl employees there should be provided close at hand at least five toilets. The toilet rooms should be kept clean and well ventilated. Washing facilities should be in the room or an adjoining room. Receptacles for refuse are necessary. Means for obtaining sanitary napkins should always be present in these rooms.

CLOTHING

In departments where men and girls work together great difficulties in ventilation are presented during the winter months because of the flimsy waists worn by girls. They are easily chilled when a window is opened, and demand more heat than is wholesome in the departments.

Older gynecologists have complained of the tight corset and of the heavy skirts worn by women, and hanging from the waist, as the most frequent causes for enteroptosis and pelvic abnormalities among women. Today tight corsets and heavy clothing are not so prevalent, neither are they as important a causative factor of these conditions as the faulty posture assumed by so many women and girls in standing and walking.

Shoes still play an important rôle in reducing the efficiency of working girls and undoubtedly contribute largely to many pelvic disorders. It is obvious that the high Cuban or French heel with the thin turned sole or the low pumps were never made to work in, especially if the work requires stand-

ing. If working women can be persuaded to wear shoes modeled after those recommended for soldiers, they will develop strong feet and will be able to qualify for many more positions than have been opened to them in industry in the past.

High-heeled shoes, loose skirts, flowing sleeves and other peculiarities of dress are hazardous in occupations about machinery. During the war one state factory inspector informed me that in a large industry where women employees had largely replaced the men there was a 50 per cent increase in the number of fractures among the employees as compared with the year before. He claimed that in 75 per cent of these cases of fracture, the high-heeled shoes worn by the women were responsible.

DISEASES COMMON TO WOMEN EMPLOYEES

From an analysis of fifteen thousand cases of absence from work on account of sickness I found that headaches caused 24 per cent of the absenteeism. Headaches are more common among girls than men and cause a great loss to every concern employing girls. The condition is usually indicative of some other trouble, the correction of which will stop this drain in efficiency. Constipation is present in many cases, while diseased tonsils, defective teeth, and other foci of infection about the nose and throat, as well as defective vision, are frequently the source of headaches. Fatigue poisoning, faulty diet, especially at the lunch hour, insufficient water drinking, late hours, and many other conditions, either in their work, in their living conditions, or in their bodies, are found as the cause of headaches when the physician takes the time to carefully analyze these cases.

Dysmenorrhea came second in the causes for absence, making 18 per cent of the absenteeism. When we consider the great number of girls who must rest for a few hours or slow up in their work for a day or two because of this condition of painful menstruation, we realize that this problem is one of great economic importance, causing an incalculable loss to all the concerns employing great numbers of girls.

The causes of this condition are many. A small percentage are due to anatomic displacements or some pathologic change in the generative organs. The majority of the cases, however, are traceable to other conditions more or less remote from the pelvis. Of these, constipation, and the conditions predisposing to this, such as improper food, lack of exercise, etc., is the commonest cause. For several years many state legislatures have endeavored to improve health conditions among working girls by enacting laws making it necessary for them to sit while at work. In my opinion constant sitting during the long working hours is as bad, if not worse, than constant standing. This sitting posture causes more or less congestion of the pelvic organs which is increased by constipation so often associated with constant sitting. If girls could be persuaded to dress properly and then could be gradually trained to standing and walking for several hours, much healthier employment could be found for them than the sedentary occupations to which they are now condemned, chiefly by legislation. Under the existing conditions, occupations which allow part time sitting and part time standing, or, if this is impossible, frequent rest

periods which will allow the girls to stand and move about, will be found of the greatest benefit in overcoming dysmenorrhea.

The next commonest cause for this condition is in an unstable, nervous mechanism. A large percentage of the girls who report to the doctor's office because of painful menstrual periods also report at other times because of various nervous manifestations, such as fainting, hysteria, "nervousness," and other neurasthenic symptoms. I have submitted hundreds of these girls to thorough physical examinations (not including vaginal) and many of these have shown signs of "neurocirculatory asthenia," the long narrow chest with the acute intercostal angle (Spiller type), movable or even floating kidneys, especially of the right side, exaggerated abdominal reflexes, and general enteroptosis. Many girls suffer from neurasthenic symptoms during their periods which are based upon the teaching or lack of teaching of the mother. They have been told to keep quiet, avoid excitement, never bathe and similar instructions, all of which stimulates fear of consequences and tends to develop the neurasthenic state at each subsequent period. It is imperative that our girls be taught that this is a normal condition and should not be regarded as a "sick time." Fear is one of the greatest breeders of dysmenorrhea.

I have submitted girls to vaginal and rectal examinations, usually under gas anesthesia, whose dysmenorrhea could not be accounted for by the above conditions or cured by the correction of the same. Only a small percentage of these cases showed definite pathologic changes which could account for the dysmenorrhea. Of these, an acute retroflexion of the uterus was the commonest finding, marked retroversion being the next commonest condition. These conditions should, I believe, be considered as possible causes only when associated with inflammatory changes. In many of these cases the rectum was found impacted with fecal matter even when constipation was not complained of. Care of the bowels and proper exercises, such as assuming the knee-chest position for several minutes, three times a day, relieved many of these, while in a few an operation was necessary. The operative cases gave uniformly good results chiefly because such radical treatment was not instituted until all other sources of the trouble had been eliminated except, perhaps, in some due to neurasthenia.

The number of girls suffering from dysmenorrhea in the working force can be greatly reduced by systematic efforts directed toward this end under the supervision of the medical staff. Here nurses and intelligent foreladies can be of greatest assistance, in fact they must often take the lead in directing the routine measures suggested by the doctor. The first essential is to decrease the number of cases of constipation to a minimum. Next, every industry employing girls should provide the means for healthful recreation including games which afford plenty of outdoor exercise. Instruction by lectures will be found of great value, but better than this is a careful study of each case of dysmenorrhea followed by individual instructions concerning the methods of overcoming it. The nurses can give these instructions by many intimate talks with the girls. Hot drinks, especially those of high caloric values, combined with a short

rest in the rest room, will enable many to return shortly to work, whereas medicine given to relieve pain only tends to create a habit.

Following the teachings of certain gynecologists concerning the cocaine-ization of the little tubercles or "sex centers" in the nose, as a means of relieving dysmenorrhea, I had the opportunity of trying this out in several hundred cases. In those cases showing a marked neurasthenic tendency, remarkable relief was often obtained by this measure. Efforts to relieve them by other suggestive measures were not clearly successful. No relief was afforded in those cases where some pathologic pelvic condition was later discovered. There were a few cases of dysmenorrhea which could not be accounted for by the nervous state, by constipation, or by any pathologic pelvic conditions which yielded to this form of treatment. It was hard to explain the relief obtained by some of these cases on any other hypothesis than that of suggestion and yet there were some cases which seemed to be benefited when the element of suggestion was completely eliminated.

Constipation is one of the commonest complaints among girl employees and plays a very important rôle in the minor illnesses causing short periods of absenteeism. In over a thousand consecutive records of working girls, approximately 33 per cent gave a history of constipation, 20 per cent of whom were habitually constipated. The easiest course for the doctor to pursue in these cases is to give them a Seidlitz powder or a pill, but such a method only serves to increase the trouble. For years I met this problem by giving every employee who complained of constipation a printed diet sheet containing anticonstipation foods which could be readily purchased at the restaurant or carried in the lunch basket, as well as served at home. In addition, each case was given a prescription for a fruit mixture, similar to fig paste.

In one department employing twenty girls I found that 70 per cent of these suffered from constipation and approximately 50 per cent had dysmenorrhea. Efforts to overcome these two conditions were concentrated on this group. The forelady secured a table in a restaurant where they could all eat together and insisted on the manager of the restaurant serving the girls with at least two of the articles mentioned in the constipation diet list. She also saw that the girls made up the fruit mixture and used it. In addition, they were stimulated to take plenty of exercise outside of working hours. Within one month the constipation was completely overcome in every case, and within three months the ten girls who had been accustomed to report to the rest room for their sick time or to remain away from their work for a day, ceased this practice.

Stomach trouble, nausea and cramps and pain in the side not related to the menstrual period are symptoms frequently complained of by girls who have lost time from work, or who come to the rest room seeking relief. Girls arise in the morning, hurriedly dress, and because they "don't feel like it" or because they are late, rush off to work without eating. About the middle of the morning they become weak, sick at their stomach, and are forced to report to the doctor's office. Usually a little food, a glass of malted milk, or a hot chocolate furnishes quick relief, enabling them to return to work. On

the other hand, these stomach conditions, fainting and nervousness are the commonest manifestations of fatigue poisoning in girls. When a girl reports three or four times with these conditions, a careful investigation of her working conditions usually reveals the cause.

Backache is a frequent complaint among girl employees. The majority of these girls have been told by their family physicians, by their mothers, or by some well-meaning old lady that the backache is due to inflammation of the ovaries. It is surprising to find how many girls think their backaches are due to pelvic inflammation. A careful study of these cases shows the greater number of backaches are due to causes removed from the pelvis and the correction of these causes cures the backache. Judging from the percentage of cures, the commonest causes for backache are badly diseased teeth, infected tonsils, flat-feet, high-heeled and other types of faulty shoes.

From this short résumé of the diseases most prevalent among working girls it is evident that preventive gynecology can find a great field for study and development in these health departments of industry.

MEDICOLEGAL

The commonest gynecologic conditions complained of by women employees as the result of injuries sustained, are backache associated with pelvic disorders, displacements of the uterus, miscarriages in married working women and dislocated coccyx.

A careful study of the various causes for backache will usually clear up this claim, especially when a careful vaginal examination reveals some old pelvic inflammation. In my experience four different girls have gone to lady physicians for an examination following injuries followed by backache. In these four cases the woman physicians diagnosed dislocated coccyx. Careful x-ray examinations and the securing of a competent gynecologist or surgeon as an arbitrator resulted in the claims of these four cases being dropped. I have seen two other cases where coccygodinia followed severe falls and were undoubtedly caused by injury to the coccyx. In one of these cases there was considerable pain and swelling in the floor of the vagina.

Girl employees very frequently complain of displacements of the womb as a result of injury. In my experience the commonest causes for these claims are such accidents as falling down stairs, or being forcibly knocked down by some fellow employee running through the aisle, by a truck, or an automobile. Practically every one of these claims develops after the girl employee has consulted the family physician; or quite frequently after some woman physician has told her that a displaced womb has resulted from the accident. Often this statement is made by the family physician without a vaginal or rectal examination being made. These girls will complain of severe pain in the back and of painful menstrual periods, both of which "never existed prior to the injury." All such cases should be submitted to a thorough pelvic examination. This should always be done in the presence of the mother or a female relative and a nurse and preferably with the patient anesthetized with nitrous oxide. Where this has been done, I have never found a case which showed the uterus displaced except in two older women, both of whom showed

other evidence of a displacement of long standing, such as relaxed vaginal walls, and in one a definite cystocele and rectocele.

Personally, I am convinced that a permanent displacement of the uterus never follows direct violence. It is conceivable that such violence might cause a temporary displacement, but the organ would undoubtedly almost immediately resume its normal position. Pelvic symptoms may follow severe trauma in the region of the pelvis and in such cases temporary displacement may be present which must be treated by rest and other means, often resulting in temporary disability such as may follow any strain. The only compensation, therefore, which should be paid such cases is for this temporary disability. It is often cheaper in doubtful cases to repair the condition, paying compensation for the time lost from work, just as in the case of hernias, the traumatic origin of which is doubtful rather than allow the condition to persist with the subsequent claims for permanent compensation.

Recently I was called on an injury case where the woman employee—twenty-eight years old, stepped on an object on the floor while at work, causing her to fall. She was not severely injured and was able to finish her day's work and then go home on the street car. That night labor pains developed, associated with hemorrhage and a few days later she had a premature labor, with the birth of a five months' fetus. This married woman had been employed only two weeks by this concern—was not examined for employment and naturally blames the fall for the loss of her baby. In the absence of history of other miscarriages and with definite witnesses of this fall the court might readily assume this to be the most probable cause of the miscarriage. A fifty thousand dollar lawsuit is pending as a result of this accident. The employment of married women, therefore, introduces many other factors into the gynecologic problems in industry.

Intolerable and inhuman conditions for our working girls and women still exist in many places. Child labor with the employment of young girls even before the age of puberty still persists in many sections of the country especially in the South. Every one of you have witnessed the hundreds of prematurely old women who come to the dispensaries of our large cities with relaxed abdominal walls, cystoceles and rectoceles and prolapsus uteri. Many of these are mothers with several children to care for during the day and then are forced to seek a living as scrub women in our large office buildings at night. Overworked, underfed, and without sufficient sleep, these women are leading an intolerable existence in our midst. Hundreds of thousands of working girls are undermining their future usefulness as mothers, and even their ability to become mothers, by working in places where occupational diseases are prevalent because of lack of industrial sanitation. Thus while we can point with pride to the accomplishments of industrial medicine and surgery, still there is a great work confronting the medical profession and the gynecologist of the future will find that he has a very important rôle to play in these efforts to conserve the Nation's man power and woman power.

THE DEVELOPMENT OF PRENATAL CARE AND MATERNAL WELFARE WORK IN PARIS UNDER THE CHILDREN'S BUREAU OF THE AMERICAN RED CROSS*

BY FREDERICK L. ADAIR, M.A., M.D., MINNEAPOLIS, MINN.

PRE- OR ANTENATAL care is that part of a Public Health Program which has as an ultimate object the influencing of the health of the offspring beneficially by surrounding the mother with proper conditions during pregnancy. It is virtually inseparable from that part of a Maternal Welfare Program which has to do with safeguarding the health of the prospective mother during gestation. These are combined with another part of the Maternal and Infant Welfare plans which deals with the proper care of mothers and infants at birth and during the lying-in period. It seems logical to consider the so-called pre- or antenatal care which deals with the prospective mother and future offspring during the period of gestation as the natural connection between maternal and infant welfare work.

It might be well to summarize briefly what the author understands by a Maternal Welfare Program in relation to Public Health work, especially that dealing with the care of infants.

FUNDAMENTALS OF A MATERNAL WELFARE PROGRAM

Any complete health and social welfare program should include two public welfare activities, viz: maternal and infant welfare, which are closely related and should be very carefully coordinated. These activities are intimately bound up with the family and concern particularly the mother and child. While these two sub-programs are more or less closely related to all the other public welfare work, they have more points of contact with each other than with the rest of such activities. From an administrative viewpoint these two activities could be comprised in a maternal and child welfare program, but from a medico-social standpoint the work should be handled by experts in the different lines of work.

The contact between these two phases of work may be termed "pre- or antenatal care." This implies care both of the prospective mother and child. It should be supervised by a doctor with helpers who are especially competent to direct and to deal with the problems of "prematernity." From the viewpoint of infant welfare workers, the results to be obtained from this care of mothers are: (1) the lowering of infant mortality especially the early mortality; (2) the lessening of morbidity to the lowest possible level; (3) the handing over of a healthy child as early in its life as practicable, with its mother able and fit to care for and nurse it, to a doctor who is competent to deal with the many problems of infant life. The elaboration of this program

*Read at the Forty-Fifth Annual Meeting of the American Gynecological Society, Chicago, May 24-26, 1920.

of infant and child welfare may be left to those who are more competent to pass on this phase of the work.

Prenatal work is a small part of the maternal welfare program, for the latter involves various activities. It comprises so many kinds of work and thought which are related to all sorts of welfare ideas and plans that it is undesirable if not impossible to carry out the complete program except as a part of a comprehensive general program.

The objects of the maternal welfare program are: (1) to develop healthy parents, especially mothers who are intelligently trained; (2) to bring them through life to maturity capable of having and rearing normal children; (3) to reduce the maternal, fetal and newborn mortality to the lowest possible level; (4) to leave the mother with a desire and capacity to bear and rear children properly in a sufficient number and of such a quality as not only to maintain the integrity of the human race, but to constantly improve its character.

This implies the improvement of the individual by bettering his antecedents, by protecting him from the folly and ignorance of his progenitors. It means the study, investigation and application of principles which will remove conditions unfavorably affecting future generations and creating those which tend to improve the offspring.

It is desirable that in the dependent stage of their lives individuals should be so cared for that they will pass through infant, child and young adult life into maturity with minds and bodies as nearly perfect as possible, and so trained as to be able to give their offspring the best possible care, besides transmitting to them a legacy of sound body and mind.

Parents should have good antecedents, a good environment, be properly reared, educated and taught not only the care of themselves, but of those for whom they are responsible and with whom they are associated in life.

This suggests the next phase, by which we seek to protect individuals from the acts of others by means of certain laws and regulations affecting their conduct. In this way the health and welfare of the community is conserved. This is of course part of a general welfare legislative plan, but there are many special problems which affect women and especially prospective mothers, which have to be very thoroughly understood and carefully worked out. It must not be forgotten, however, that all public welfare work, while it has definite and concrete results on the existing generation, has a more permanent effect on future generations and is therefore intimately associated with problems of heredity (which are really a part of a large maternal welfare program).

The family should be protected from various detrimental influences by education, legislation, proper help and advice. This means that each family should have a normal economic status, proper housing, etc., good sanitary surroundings, proper advice and care in case of physical or other needs resulting from disease, economic reverses, or distress of any kind. Some of the medical problems which vitally affect the individuals and the family are those

dealing with tuberculosis and venereal diseases. These activities are very closely allied to maternal welfare work.

A comprehensive maternal welfare program should include investigation into certain medical and social problems. This virtually constitutes a study of many problems connected with the production of human life. Some of these medico-social problems which vitally affect the individual, the family and the community, are those relating to sterility, whether apparent or real, to abortion, to premature births, and stillbirths, whether ante- or post-partum. A study of causes and methods of controlling promiscuous sexual relations and, from a medical standpoint, investigation into methods of eradicating venereal diseases are of the utmost importance in any maternal welfare scheme.

An analysis of the causes and practical application of the principles for preventing the development and transmission of degeneracy, insanity, physical defects would be of great benefit to the human race.

A careful and unbiased study of the causes of economic insufficiency of the family with its disastrous effects on the mother and children is one of the fundamental problems of maternal and infant welfare. An investigation of the causes underlying the diminishing birth rate resulting from increasing sterility, abortions, desire to limit the size of families, etc., is of prime importance to many countries.

These are some of the many important problems with sociologic and medical bearings which have a close relationship to a maternal welfare program.

It is necessary that some fundamental principles, definitions and plans be established for this sort of work in different countries. This is especially true where statistics are used and particularly where they are used for comparative purposes.

Of medical problems which need special investigation, there are many. Practically all conditions which complicate pregnancy, labor and post-natal conditions in mother or child need further study. Many of these are practically unexplored fields. Of the cause of eclampsia we are ignorant. We know practically nothing of the physiology and pathology of the child developing *in utero* and the effect of maternal environment, habits and diseases on the fetus.

The educational program involves the education of young adults along proper sex lines. This necessitates careful study and thought in laying out the educational program as well as in selecting those who are to give this instruction. It includes the education of prospective fathers and mothers in the physiology, hygiene, pathology, psychology, sociology, etc., of maternity and infancy.

Of the highest immediate and practical importance is the proper education and training of those who give prenatal, natal, and postnatal care to mother and infant. This includes doctors, midwives, nurses and social workers and the institutions which are responsible for their training.

The legislative program includes enactment of those laws which are designed to protect the family unit in health, economic independence and happi-

ness, or to prevent any invasion by medical or social disease. This means, of course, the protection of motherhood and infancy from disease, poverty and distress. The mother must not be forced into conditions of existence which will be detrimental to her or the future child. This means provision for proper maintenance, good living conditions, protection from disease, improper work, etc. Laws should protect the unborn child from death, disease, and harmful influences, in so far as this can be accomplished. Legislation should provide for the license and proper inspection of institutions and individuals to whom the care of mothers and babies is entrusted. There should be some assurance that they are properly trained and capable of carrying on their work.

Some provision must be made for the necessary institutions which include in addition to the educational institutions for training special workers, others such as communal medico-social centers from which medical and social activities in a given area should emanate.

Maternal and infant welfare activities make up an important part of the work. Of the work of these two groups, the "prenatal" and nursing clinics should be most closely coordinated.

Maternal welfare work should include some institution for the education of prospective parents, especially the mothers, where talks and demonstrations give them the necessary knowledge of themselves and their babies. Home visitors should go from these centers to the house where the women can be advised and taught in their own homes.

Provisions should be made to furnish proper prenatal, natal, and postnatal care in the home for both mother and newborn.

There must be adequate and proper provision for prenatal, natal, postnatal and other necessary medical, dental, nursing and social care including domestic economy, dietetic and nutritional work. It is necessary to have prematernity homes and hospitals, as well as maternity and gynecologic hospitals. Postnatal homes are necessary for those who need care for medical or social reasons. Public welfare activities are so intertwined that it is impossible to isolate one from another, but there is not a more basic work in the whole plan than that of maternal welfare. The mother is the keystone of the family unit and the whole arch of human welfare and progress is sustained by the weight which rests from all sides on that keystone.

Both maternal and infant welfare work are of the greatest importance in every country, but for many reasons they have been and are especially important in France. In practically all countries the infant and child welfare program has been developed more quickly and thoroughly than that of maternal welfare and of late has included more or less of the problems of maternal welfare. This is especially true in the United States.

The very praiseworthy activity of physicians and other welfare workers who have made a special study of infant and child life, together with the natural appeal which babies make to all, has contributed very largely to the success of their work. This should not lead us to neglect the more abstract and less tangible, but none the less great, results which may be derived from a properly worked out plan of maternal welfare.

This work is especially important for France because of the low and diminishing birth rate, the high percentage of sterility, the large number of abortions, the great number of stillbirths and high infant mortality especially in the first two weeks of life. The frequency of venereal diseases and tuberculosis make the early observation and careful study of all pregnant women of the greatest importance.

Professor J. M. Slemmons, who studied the obstetrical situation in France, and made his report to the American Red Cross in October, 1917, stated among other things that "thoroughgoing antenatal supervision, nevertheless, is a requirement of the very first order in France." Dr. DeNormandie in his report made less than a year later, saw the advisability of establishing a prenatal care program in France.

In September, 1918, the writer was asked by Major W. P. Lucas, head of the Children's Bureau, to investigate and report on the obstetric situation in Paris with special reference to prenatal care. In my report it was stated that "the great need is for social work in connection with the maternity hospitals and the establishment of properly conducted prenatal work would be the greatest boon to the mothers, to the maternity hospitals and to France. It is not necessary to discuss the value of prenatal work as a general proposition, but there are certain conditions in France which would make the establishment of such a work of more benefit to France than almost any other thing which could be done. The machinery for carrying on this work in Paris is already partly constructed but needs to be properly adjusted and supplemented. What is needed to perfect this system is closer contact with the patients and careful study of their actual home and economic conditions, not *en masse* but as individuals. Mothers should be treated with the greatest possible kindness and consideration, for they are the ones who make the greatest possible sacrifice for the benefit of others." Aside from this appeal for the sympathetic and intelligent care of prospective mothers certain statistics were cited showing some important points of attack in the effort to conserve human life.

It has been estimated and openly stated by publicists that there are now about 500,000 abortions annually in France. This exceeds the present number of living births. The number of women who enter hospitals for treatment of complications resulting from abortion is constantly increasing. In Paris during 1912, there were 4,220 stillbirths, which practically equaled the total number of deaths during the first year of life.

In France during 1912, there were 742,435 living births and 34,695 stillbirths. The deaths during the first fourteen days of life were 19,265, making a total of 53,960 deaths, most of which may be regarded as due to prenatal and natal causes. The remaining number of deaths during the balance of the first year of life amounted to 59,098.

The ravages of venereal diseases on both mother and offspring, the high mortality of tuberculous women who are pregnant, and the dire effect on their offspring make the detection of these diseases early in pregnancy of paramount importance.

The detection and treatment of other diseases accidental and incidental to pregnancy is, of course, of the very greatest importance.

The relief of social distress and disease is not less important than the cure of physical ailments and diseases. The happiness and well-being which can be brought to the individual mother, and those associated with her, by intelligent guidance, sympathy and help is unmeasurable. Perhaps the objects of this work may be concisely given by translating an outline which the author used as a means of interesting some of the French people in carrying on the work.

The raising of a fund was asked to establish and develop:

1. Medico-social work in connection with the maternity services of the hospitals of Paris.
2. Medico-social consultations for pregnant women in sections of Paris remote from the maternity hospitals.
3. Consultations for pregnant women in close association with the consultations for nurslings.

The aims of the work shall be:

1. To educate the prospective mothers how to best care for themselves and their families.
2. To develop their social and economic independence.
3. To give them moral support and assist them to obtain material aid when necessary.
4. To see that they take proper precautions to prevent and cure disease.

The results which may be attained are:

1. An improvement of family life.
2. A diminution in maternal and infantile morbidity and mortality.
3. A decrease of venereal diseases, abortions, stillbirths, and premature births.
4. An increase in the number of pregnancies and normal births. Finally by a study of the medico-social causes of depopulation, to reach a thorough understanding of the causes and at the same time the method of remedying these conditions.

Plan of work as put in operation: In September 1918, after the investigation of prenatal care mentioned above it was necessary to leave Paris to carry on some emergency war work, so that no further steps were taken until the latter half of December, when after some necessary preliminary arrangements, the work was begun in the 18th and 14th arrondissements and a little later in the Municipal Dispensary at Bicetre, where established clinics for nurslings and children were being conducted under the auspices of the Children's Bureau, American Red Cross. The general idea of the work was to get in touch with as many of the pregnant mothers in the community as possible. The contact was to be from both medical and social points of view in the consultations and the home as well.

It was not thought possible or advisable to attempt a large or complete work of maternal welfare, so certain definite objectives were determined. These were from a medical point of view:

1. Providing consultations for pregnant women easily accessible to them.
2. The establishment of a different type of consultation for pregnant women where the women would be periodically observed by a well trained medical man and not by a "sage-femme."

And also from a social point of view:

1. The demonstration that those who occupy a low social and economic level have other needs than spasmodic material relief, and that such relief should only be given after proper investigation and study of their needs, except in emergency.

2. The proving of the possibility of entering the homes of these poor people not only to study but also to help their morale and give such material aid as might be necessary. Many of the French people, especially those of the better economic and social class, have been very skeptical of the idea of home visiting.

3. Instilling the idea of cooperation and coordination in their relief work both medical and social.

The essential features of the plan were:

1. Medical supervision during as great a part of pregnancy as possible to prevent the occurrence of disease or detect its presence early and to improve the health of the patient. This is accomplished by demonstration of proper diet, clothing, personal and home hygiene, securing of as good environment as possible, and the use of appropriate curative measures for physical and social ills.

2. The giving of social care, including a study of all the problems which are not medical, with the object of raising the mother and, as a result, the family to a higher level of living. This is done by talking over their problems and giving advice and help in avoiding and solving their difficulties. They are visited in their homes and their needs are investigated with the desire to see that they secure material relief when it is necessary, but always with the thought of showing them how to be independent and solve their own problems wisely. They are especially helped to understand about maternity and care of infants. This is done by individual instruction and advice, also by getting them together into groups where they can be instructed in making the proper clothing for themselves and babies, in the necessary preparations of themselves and their homes for the confinement and the proper care of the babies. They are also taught how to improve their individual, family and home surroundings, especially in regard to food and hygiene.

3. To follow up the cases after confinement and see that both mother and baby are maintaining proper health under as good living conditions as possible.

The details of the plan are the establishment and maintenance of prenatal consultations in quarters where no consultations for pregnant women are easily accessible to them. These centers must have provision for both medical and social supervision of the cases; at the consultation itself and also in the home. In other words, there must be a connection between the consultation and the home of the patient by some plan of home visiting and instruction.

Advice, help and instruction may be given to groups of mothers in regularly conducted classes where instruction along various lines may be secured by them.

In an effort to reach every pregnant woman of the quarter as early in pregnancy as possible, and see that she received proper care and instruction

not only for herself, but later for the baby, contact was made with the "mairie," with institutions which care for mothers and also with those who care for the mothers in their homes.

A pregnant woman should be followed with care through her pregnancy and confinement and should later be guided into the consultation for nurslings. All this should be done not only for the benefit of the baby but also to keep her under observation to make sure that she is able to care for herself and her family in the best possible manner.

The prospective mothers were found by (1) securing from the "mairie" a list of those who applied for the "allocation;" (2) establishing a "liaison" with the maternity hospitals of the neighborhood, to obtain the names of the women registering in their consultations who lived in the quarters where the prenatal work was being conducted; (3) developing friendly relations with the "sages-femmes" of the section and helping them to give their patients better care; (4) reference of cases from other consultations as that of the Rockefeller Commission for Prevention of Tuberculosis and those of the Infant and Child Welfare Work; (5) the bringing of one woman to the consultation by another; (6) accidental contact with the home visitors.

INSTRUCTIONS FOR PRENATAL WORKERS

The following ideas and instructions were given by the author to those who were engaged in carrying on the prenatal work.

It should always be remembered in caring for pregnant women that they are worthy of all the help and consideration that can be bestowed upon them. They are often very uncomfortable, with symptoms incident to their condition, and frequently their mental and moral outlook is changed.

It should never be forgotten that one is dealing with a person who has as many or more human rights than any other person and that there is always potentially a second individual whose rights cannot be ignored from any point of view. It should be the aim of those who care for the pregnant woman to understand all the factors which interfere with her living in good health and happiness and which may interfere with the life, health, or happiness of her offspring.

We study disease in the individual to understand her exact condition and thus be able to use the best means to prevent and cure the particular affection of the individual. We treat a patient with typhoid fever to cure the individual, but we also look for the disease in others in order to find the source from which the disease arose. Many times it is very difficult, if not impossible, to discover the origin of diseases from the study of a single case, it is therefore necessary to study groups of similar cases in order to find the source and the cause of the trouble. We are then in a position from which we can attempt to prevent the occurrence of this disease not only in the individual, but also in groups of people. This we call preventive medicine.

In social work, we try to discover the causes of social and economic distress in the individual and seek to apply the remedy. It should always be our aim to discover the source of trouble for groups of people and to strive to remove the causes.

In medicine, it is impossible to control the spread of disease by dealing solely with individuals, it is absolutely necessary to understand and remove the causes from communities afflicted with the disease. We have to treat cases at the source to control the spread of disease. In society it is not possible to deal solely with the individual in removing social distress, the causes must be discovered, the source found and the trouble removed from groups, if the work is to rest on a permanent foundation.

It is only by understanding the causes and removing the sources of trouble that society will ever be able to exist constantly and relatively free from either disease or social afflictions.

The purposes of all medical and social work are not only to study and relieve the discomfort and suffering of the individuals themselves, but also to investigate and ultimately discover and eradicate the causes of these conditions in society as a whole. In order to carry on this work systematically it is necessary to have some record of the study of individual cases. It is, of course, possible to have records so elaborate as to defeat the immediate objects of the work. The ideal record should comprise only the absolutely essential information and only such items as can be secured with relative accuracy. They should be elastic enough to fit the needs of most cases and at the same time simple enough to be easily understood. It should be possible to compile data from these easily and thus obtain a study of groups from the information on the records of individual cases. In this way some of the ultimate causes and sources of difficulties may be found. The workers should never forget that records are in themselves not the object of their work, but are simply a means to an end. They serve as an outline to be followed intelligently, as a memorandum of the individual case and ultimately as a means of finding the cause and getting at the root of existing conditions.

Some explanation of the prenatal records, including the social histories, an idea of their purpose and an explanation of the information contained on them may be necessary.

After registration at the consultation, the patient was given a card to be enclosed in an envelope and retained by her at all times. The information on this card was the name, address, registration number and date.

The place of confinement was indicated and who was to care for her, the date of her last menstruation, of quickening and the probable time of confinement were recorded, any accidents of pregnancy were noted, the number of previous pregnancies was recorded and any important complications stated. Findings of importance were mentioned, the character of the pelvis, the condition of the urine and blood pressure were briefly given. The patient was not only supposed to bring the card with her to the consultation, but also show it to her attendant at the time of her confinement, so that the information secured at the prenatal consultation would be available for use by the obstetrician or midwife. Her attendant was asked to supply certain facts which were to be recorded on the card, as the date and place of confinement and any complications. The sex, weight, length and feeding of the child were noted on the card. The patient was supposed to bring this information regarding herself to the postnatal consultation; and that concerning the newborn to the

clinic for nurslings. The card also served to remind the patient of the date on which she was to return to the consultation.

The purpose of the card described above is, of course, apparent and it is not as elaborate as might be inferred, for the essential information regarding a case can usually be given in very few words. It is extremely important that the work of these different agencies be closely coordinated, and that a certain minimum of information regarding the case be passed along with the patient.

The social card gives an outline for the study of the living conditions of the family, i.e., an investigation of the members of the family and their habits and environments. This chart should be finally filled out after the worker has confirmed, in so far as possible, by personal observations, the statements made to them by members of the family. It may require many visits and much tact to secure the required information. Much of it can be secured without direct questioning by conversation and observation.

This chart is divided into five parts. (1) A study of the personnel of the family and those closely associated with them. (2) An investigation of the work of the different members of the family. (3) The observation of the housing conditions, which is extremely important, because it has much to do with their comfort, health and happiness. The accessibility of conveniences and necessities such as light, heat, and water, including plumbing and the general sanitation and crowding of occupants are very important facts to ascertain. (4) An analysis of the monthly expenditures of the family. (5) A record of the monthly revenue. The last two deal with the economic and financial condition of the family. This is a very delicate subject, but nevertheless extremely important, as it affords opportunity for making a partial diagnosis of many social afflictions. For instance, two families of the same size may be living in practically the same surroundings and both expending all of their income. One may have 50 per cent more revenue than the other, but through poor management or carelessness be reduced to the same economic level. Such a family should be taught how to live better, at least the rising generation should be shown how to improve their condition and not fall into the same errors. Another family, at one time independent, through misfortune such as sickness, death or loss of money, may be forced below their previous economic level. We could term such a class a marginal group because they live so close to the income necessary for independent living that any mishap or mismanagement reduces them to a financial condition where life becomes a mere struggle for existence. It may be possible to correct their condition by placing them in work of which they are more capable. It may be possible to alleviate their condition only by rendering assistance. It must never be forgotten that many of these afflictions are due to social and economic conditions which can be changed only by applying the remedies to larger or smaller groups of individuals. It is important to analyze the income and expenditures with reference to each other and to the different items making up the budget. It is perfectly possible to spend such a proportion of the income on food that the family is forced to live without other necessary or desirable things,

when with a much smaller expenditure, the family would be just as well nourished.

The medical records consisted of two cards. On one the history and results of physical examination were recorded. The information on this chart comprised the past history of the patient and her family, information of all previous pregnancies and labors, a history of the present pregnancy besides the record of a general physical examination as well as an obstetrical examination.

The other medical card was used for recording routine observations each time the patient returned. It was so arranged that this information could be written under the proper date in parallel columns. It comprised such information as the temperature, pulse, blood pressure, urinary findings, edema, etc.

One other card was used for the reference of cases to other agencies. The necessary information was given on this card and space was left for making a proper report back to the consultation.

The workers were taught to use these charts, but some difficulty was encountered because of the short time which we had to train them, and also on account of some unavoidable but rather frequent changes in personnel. On the whole they served their purpose well.

After registration and taking the social and medical histories, the patient was examined physically.

A certain routine was established in which all patients coming for the first time were given a complete physical, in addition to the obstetrical, examination. Any patient pregnant for the first time, or who gave a history of abortions, stillbirths, or specific symptoms was sent to the laboratory for a Wassermann test. Any case subjected to tuberculosis contact, or presenting suggestive symptoms, was sent for a special chest examination. Cases giving evidence of other diseased conditions were sent where they could receive appropriate care.

Cases were told to return at least once each month during the first seven months of gestation, and once each week after that period. In case they failed to return, the home visitor was asked to trace them.

The routine followed on each return visit was to secure the patient's weight, temperature, pulse rate, hemoglobin, blood pressure, and urine for chemical and microscopical examination. On each return visit, certain questions were asked regarding her general health, and a cursory physical examination was made. At the beginning of the last month of pregnancy, an obstetrical examination was made in all cases. Vaginal smears were not made and examined as a routine, but only in those cases which were regarded as suspicious. Special study and care were given to those cases which presented conditions which needed it. Postpartum examinations were also made.

Social work was established and carried on in the sections of Paris as will be enumerated and also in four of the maternity hospitals. Medical work was conducted in conjunction with the social work in the prenatal consultations which were established in the different arrondissements, but no medical work was undertaken in the hospitals, neither was any attempt made to modify

the routine of obstetrical work established there, though it failed to meet the ideals of any modern clinic for pregnant women. It was not thought to be tactful or proper to criticize or suggest too vigorously to men who, for nearly five years, had been driven to heroic actions to meet the demands of military medicine and surgery.

Special work was established in four of the maternity hospitals, and the author feels very strongly that it will be the beginning of a work which will be most vital in the future development of France, which has had and still has the most serious problem to solve in reference to natality.

It may be of some interest to give a brief summary of the work and some of the immediate results.

In the 19th arrondissement where prenatal consultations were being conducted, a visiting nurse was sent to the maternity services of Tenon and Lariboisiere Hospitals once each week to make follow-up visits to those who went from the 19th arrondissement.

We tried to help the mothers who were to remain home for the confinement make the necessary preparations.

In the social center a class was held once each week where mothers and expectant mothers were shown patterns of things they would need. They were taught how to care for themselves and their babies, and were given more or less personal instruction. They were also sent to food consultations.

Any cases suspected of accidental diseases such as tuberculosis and venereal infection were sent to special consultations for both diagnosis and treatment. Those women who presented any obstetric complications were sent to maternity hospitals for special care. The work was carried on in close cooperation with that of the Rockefeller Commission for the Prevention of Tuberculosis, and also with the Children's Bureau of the American Red Cross. Every mother who had a living baby returned to the Nourrisson consultation, three of which were carried on each week.

The nursing and visiting work was carried on by Mmes. Oelker and Durreleman under the supervision of Miss Nellie Reed of Washington. During the six months, about 200 pregnant women were taken care of in the prenatal consultations of this arrondissement.

The consultation at Bicetre was carried on by Dr. Lantz once each week, and a rather loose connection was established with Baudelocque Maternity.

In the 14th arrondissement, the work was carried on three times a week. The home visiting was at first under the charge of Miss M. McAlanny, and later was supervised by Miss N. C. Rudd, who did most excellent work. The same general plan was carried out so far as possible in the absence of a social center, and a less complete infant and child welfare organization than that in the 19th. Over 200 cases were seen during a period of less than six months.

In Bicetre the work was taken over and carried on by the municipality. In the 14th arrondissement, the Patronage Franco-American, in close connection with the "mairie," arranged for a continuation of the work. An "œuvre" was formed in the 19th arrondissement to carry on the whole plan of the work as established there. (The name of this organization is "Pour l'Enfance et la Familles par l'Aide Sociale.")

May 1st, 1919, social visiting work was established (in four of the Maternity Services) in Baudeloeque, it was carried on under the leadership of Miss N. C. Rudd with the help of Mlle. Nageotte. The work was established and conducted in St. Antoine Maternity by Mlle. Oelker, while that which had already been started at Tenon and Lariboisiere was continued under Mlle. Durrleman.

The plan of the work in the hospitals is as follows:

I. Social service at the Consultations.

1. Inquire of each patient what can be done to help her.
2. Inquire about the doctor's prescriptions and whether the woman knows how to and is able to have them carried out.
3. Find out whether she knows what to prepare for herself and her child and see that she does it.
4. Follow-up and see that she attends the consultations as often as she should.
5. Supply her with the needed help, and check it up by the "Fichier Central."
6. In places where a visiting service exists (14th and 19th) give the names and addresses of pregnant women to the "visiteuses" with the necessary instructions. A report should be returned concerning housing and living conditions and should be sent to the hospital.
7. In the other arrondissements, make the necessary visits in as great a number of cases as possible. Follow especially the important cases.
8. Cooperate with existing "œuvres."

II. Social Service in the Hospital.

1. Visit the wards—keep in contact with all the "accouchees" and give them the social help needed for them to adapt themselves to their new problems. Help those who are going out and see that the housing and hygienic conditions are as good as possible. Follow them up, help them to take up a normal healthy life, and see that they bring their baby to the "consultation des nourrissons."
2. Organization of practical talks for future mothers, either frequenters of the consultations or who have been admitted to the "expectant" wards on: How a pregnant woman should dress; how to prepare the layette; practical demonstrations of care to be given to the newborn baby; practical lessons in personal hygiene; how to improve the hygiene of the house, etc.

An organization was formed to carry on the "medico-social" work which was installed in the hospitals. The name of this organization is "Service Medico-social des Maternites."

The author feels constrained to mention by name some of those who contributed by advice and cooperation to the success of this work. The names of some of these have been mentioned above. The seed which has been planted will be sure to grow and bear fruit under the attention of such men as Prof. Couvelaire, Bouffe-de Saint Blaise, Demelin and Funck-Brentano with the able help of their associates, Drs. Sellet, Desvraigne, and others. The help of Matte Brunot, Drs. Le Sage and Broudic and Mlle. Chaptal was greatly ap-

preciated and it would have been impossible to have developed and carried on the work in the 14th arrondissement without their help.

The author was also helped greatly by the advice and encouragement of Drs. W. P. Lucas, R. S. Haynes and T. B. Cooley, as well as by the cooperation of Dr. W. J. French, who had charge of the infant and Child Welfare Work in the 19th arrondissement. There were many others, among whom might be mentioned Miss Asche and Miss Ellen C. Babbitt.

In closing it may be well to remember that this work was carried on in a foreign land, and that if it has achieved any success, it is only through the sympathy with, and toleration of, Americans and their ideas by the French people themselves.

730 LA SALLE BUILDING.

(For discussion, see p. 200.)

THE IMPORTANCE OF A FOLLOW-UP SYSTEM FOR OBSTETRIC PATIENTS*

BY GEORGE W. KOSMAK, M.D., F.A.C.S., NEW YORK, N. Y.

Attending Surgeon, Lying-In Hospital, New York, N. Y.

IN these days of "health conservation measures" the question may well be asked whether the recently delivered mother in either private or hospital practice is accorded as much attention in a follow-up sense as a patient recovering from medical or surgical illness. It is now commonly regarded as essential to the proper functioning of a hospital that each patient be kept under observation during a definite period after discharge and to report for examination at stated intervals or be visited by the social service worker. Thus, not only the immediate but the later results of treatment are known and can be acted upon. In surgical cases, particularly, the final physiologic, as well as the anatomic outcome of the particular operation is insisted upon as a matter of record and study. Does this development in modern methods apply with equal force to obstetric patients? Is proper care extended for a sufficient length of time after delivery to obviate the possible production of pathologic lesions and to provide for their correction if noted? Laudable and constantly increasing attention has been accorded by maternity institutions to provisions for antepartum care, both for the sake of the mother and her unborn child. A thorough physical examination of the prospective mother is urged, and with blood pressure observations, urinalyses, pelvic measurements, etc., regarded as essential in every well ordered maternity. But once the interest and excitement attendant upon delivery is over, the patient in many cases is discharged with a cursory examination at the end of a stated period and little more attention paid to her. This also applies in many instances to private patients. There is no reason why this condition of affairs should be allowed to exist. Although accepted as physiologic, the process of parturition verges so closely upon the pathologic, that it is often difficult to draw a line of demarcation. Moreover, the process of involution is by no means complete when the patient is able to be out of bed, and complications may develop and escape notice if a pelvic examination is not made after the usual period of two weeks in the hospital. We may briefly inquire at this point into these possibilities and then discuss means for their correction. The usual method of postpartum examination when it is conducted, takes note of the breasts, the degree of uterine involution as determined by the lochia, the size of the uterus, its consistency and mobility, the state of the adnexal organs, the condition of the cervix and perineum. If the results of this examination are fairly satisfactory, the patient is ordinarily discharged and in many cases not seen again unless complica-

*Read at the Forty-fifth Annual Meeting of the American Gynecological Society, Chicago, May 24-26, 1920.

tions develop. Let us consider these points somewhat more in detail, although we may be accused of dealing with trite and elementary facts.

The involution of the uterus as already stated, is usually gauged by the size, consistency, and character of the lochial discharge. Ordinarily the bright red lochia should disappear after the eighth or ninth day, but inquiry will often elicit the fact that in a great many cases the bright discharge reappears after the patient has been up for several days. A bloody discharge means a halt in the process of uterine involution and above all requires rest in bed with the possible administration of oxytocic measures. A considerable amount of blood may be lost unless this condition is promptly checked, and not only does the patient suffer from this, but the congested uterus is more apt to be displaced either downward or backward. As concerns malposition of the uterus we often find an apparently normal anteversion at the end of ten or twelve days converted into retroversion if the patient be examined again four to six weeks later. This is usually accompanied by enlargement and congestion, which have probably contributed to the displacement. If appropriate measures are not immediately instituted, involution is further retarded and the uterus may remain permanently in this abnormal position. At this time postural treatment is indicated, including the knee-chest position, the so-called kangaroo walk, and having the patient avoid lying on her back. The bowels must also be kept open and oxytocics administered to reduce the size of the uterus. There is no value in the use of pessaries at this time and they should not be employed until the uterus has involuted properly and has been returned to its normal anteverted position. I have recently observed several cases in which retroversion pessaries have failed to retain the enlarged uterus. The possibility of these malpositions shows the necessity of making regular pelvic examinations at the end of the first and second month; otherwise the condition will be overlooked.

Perineal lacerations should also be observed at regular intervals. I have seen a perineum only partially healed at the end of the tenth day, yet the patient was discharged from the care of the hospital and physician. The process of repair varies with the general condition of the patient. In some it takes place quickly and a good result is present at the end of a week. In others a failure occurs because of the inherently poor character of the tissues or because of extensive trauma. In the former there is nothing to do except to reoperate at a later time. If infection has resulted or sloughing in the case of bruised tissues, operation must be postponed. Secondary perineorrhaphy at the end of ten days or two weeks is often followed by good results where the lochial discharges are fairly clean, but in the presence of a continuous foul lochia such intermediate operations had best be deferred and the wound allowed to heal by granulation. There is another class of perineal lacerations that must be noted, namely, those involving the sphincter ani that have not been diagnosed immediately after delivery. Several cases have come to my notice in which after a week or ten days with apparently normally functioning sphincter ani muscles, incontinence followed and examination showed that an attenuated sphincter was either torn or exposed in a perineal tear that had failed to heal. Such cases can usually be satisfactorily operated on at the end of two

weeks. Episiotomy, either lateral or central, provides for better healing in many cases and while I hesitate to recommend routine operation, I think that it serves a good purpose in those cases where a rigid outlet impedes the extension and delivery of the head. Lateral episiotomy has the advantage of being somewhat further away from the course of the lochial discharges, but is more difficult to repair and the resulting scar may be more painful than in the central variety.

The importance of unhealed cervical lacerations has been underestimated. The minor degrees undoubtedly heal without much disturbance, but in many cases the bilateral tears fail to unite, and considerable eversion of the anterior and posterior lips results. This exposes the lining membrane of the cervical canal and so-called "erosions" of the cervix usually follow. Unhealed lacerations of the cervix offer an opportunity for the absorption of septic material that undoubtedly in a great many cases leads to milder grades of infection involving the cellular tissue in the lower portions of the broad ligaments on either side and also the area back of the uterus included in the region of the sacrouterine ligaments. The course of this infection is insidious but is probably an important factor in producing the backache which so many women complain of during the first year after childbirth. A careful examination of postpartum cases within the first few months after delivery has demonstrated quite clearly to me that this is a complication to be reckoned. It may be avoided to some degree by treating these so-called ulcerated areas as soon after delivery as possible by appropriate local measures. In a series of hospital cases which I examined recently, every lacerated cervix was exposed through a bivalve speculum and the raw surfaces swabbed with nitrate of silver or iodine. The patients were then directed to return to the hospital at least once or twice a week for further treatment. I have also followed this out in my private cases and I think with good results in so far as a limited number seem to have been free from further complicating symptoms. The immediate repair of cervical injuries might be referred to at this point. Some years ago at the Lying-in Hospital every primiparous cervix which was lacerated was immediately sutured, but we found a marked rise of temperature in so many cases that we discontinued the procedure and limited suture of the cervix to the advanced degrees where it was necessary to control hemorrhage. I do not believe, however, that in the majority of cases proper normal healing of the cervix results, as we find a great many instances in which the marked eversion of the lips already referred to shows that union has failed to take place.

The abnormalities noted include the commoner postpartum lesions to which others may be added, such as mild degrees of pelvic inflammatory processes, particularly of the tube; involvement of the urinary tract, urethritis, trigonitis, cystitis, and pyelitis, which often are not disclosed until several weeks after labor; relaxation or inflammation of the pelvic joints; phlebitis of the pelvic veins, and finally among the more unusual conditions, degenerative changes in fibroid uteri or torsion of pedunculated ovarian cysts. Any one of the above may escape notice or may not have been present at the usual time of antepartum examination. In many instances the occurrence of such lesions

may not have been preventable, but whether or no, timely recognition and treatment will at any rate reduce the invalidism which often follows in their wake.

In the hope of stimulating a more general interest in a follow-up system, particularly for institutional patients, the writer recently undertook the circulation of a questionnaire to obtain some information as to the actual methods which had been employed by various maternity hospitals. (A copy of the questionnaire is appended.)* A total of over 60 were sent out and replies were received from 48 American institutions.

An analysis of the results shows that 36 out of 48 have some sort of a follow-up system for their obstetric patients, including regularly organized clinical facilities in charge of the attending staff. In the majority (28) the patients only return if abnormalities develop, but are not directed to report at stated intervals after delivery. In 31 institutions a social service system is maintained by nurses for following their cases and some provision is made for babies in 37 institutions. Provision for the treatment of gynecologic conditions noted after labor is made in 37 maternity hospitals and in 11 they are referred elsewhere.

The admission is made by practically every one who answered the questionnaire that a follow-up system for obstetric patients is not only desirable, but necessary. In this connection the difficulties attending the institution of such a system for hospital patients must be acknowledged. A woman who is busy with the care of her family is not always able to come back for subsequent examinations unless the condition is serious enough to compel her attendance. This applies particularly to patients that live a considerable distance from the hospital, but should not apply to private patients who ought to be encouraged to visit their physician at least once a month for three months subsequent to delivery. If this is not feasible, arrangements might be made with a local physician. In the case of hospital patients the follow-up system is favored by the employment of visiting nurses, just as is now done by surgical, medical and gynecologic services. A number of institutions have already adopted this plan and if the visiting nurse finds any gross abnormalities, a hospital physician visits the case, or the patient is directed to an institution. The organization of so-called "maternity center associations," as in New York City, may be of great value in the development of this scheme, especially as their clinics are ordinarily located nearer the patient's home than the hospital in which she was confined. Co-operation and co-ordination could, it seems to me, bring

*QUESTIONNAIRE

AN INQUIRY INTO A FOLLOW-UP SYSTEM FOR OBSTETRICAL PATIENTS

Hospital.....

Reporter.....

1. On what day after delivery is the puerperal patient discharged?
2. Is the patient directed to come back to the hospital at a stated time, or only if abnormalities develop?
3. Is there any definitely organized postpartum clinic provided on certain days to which patients may apply?
4. Under whose charge is the clinic—attending surgeon or house staff?
5. Do attending surgeons see their cases at definite periods after discharge?
6. Are notes taken of such subsequent visits?
7. Have you any method of following up cases at their homes by social service workers or nurses?
8. Have you any information based on your cases of the proportion of postpartum women examined in whom the following conditions have been noted: Malpositions of the uterus, exudates, cervical erosions, lacerations, condition of perineum and results of perineorrhaphy?
9. In the event of lesions being found, what facilities are provided for their treatment in the same or other institution?
10. Are such operations done by your attending staff?
11. Are steps taken to insure proper supervision of the baby by visiting nurses or reference to pediatric clinics?

about a working agreement in which the function of the maternity center could be increased in a most valuable fashion and the hospital perhaps saved a certain amount of trouble and expense.

A regularly organized postpartum clinic should be part of every maternity hospital equipment. To this clinic every mother should be directed to come at stated intervals if possible. At such subsequent visits abnormalities which have developed since the discharge of the patient from the hospital can be detected and appropriate treatment instituted. Patients that present gross lesions, such as unhealed lacerations, uterine displacements, pelvic tumors, and other conditions, could be kept under observation and treated surgically if the occasion demanded. It also seems desirable that gynecologic operations be done either in the same or related institutions so that the patient remain under the observation of the same attending staff through the entire period. Such postpartum, or we may call them gynecologic clinics, should be under the direct supervision of attending surgeons, and, if possible, especially in the cases of operative deliveries, the operator personally ought to make the follow-up observations.

Admitting the value and necessity of adequate observations on postpartum cases, what may be considered a practical scheme for developing this for institutional or private patients? The return of every recently delivered mother to a state of health at least approximating that before her pregnancy, if not surpassing it, should be the aim of every maternity service and also every physician who takes care of obstetric cases. It is difficult to estimate how large a proportion of invalidism in women who have borne children can be traced directly to abnormalities of their pregnancy, labor, or puerperium, but it cannot be denied that the proportion is a considerable one. The tendency of modern medicine has been towards prevention. Can it be said that this effort has been sufficiently developed in the handling of woman's most important function in life? The results of childbearing cannot be expected to leave every woman in as good condition as she was previous to parturition, but an attempt should be made to diminish the proportion of invalidism as much as possible. I believe that this can only be done by concerted effort; by impressing, on the one hand, upon our institutions and physicians the necessity of keeping these women under a longer period of observation than has hitherto been the case, and, on the other hand, impressing upon the patients and their families the necessity and advisability for such supervision. A prolonged period of education may be necessary to accomplish this desirable end, but what has been accomplished in the domain of the contagious diseases, of cancer, of venereal disease, and other conditions, can likewise be duplicated in our obstetric practice. The survey of the situation which I have previously referred to, shows that in so far as maternity hospitals are concerned, great variation occurs as to the extent to which postpartum observations are carried out. It is unnecessary to refer to specific institutions, but it was found that in many instances patients were dismissed in from ten to fourteen days after delivery without any definite instruction to return for subsequent observations. In other cases, the social service workers or follow-up nurses visited the patients in their homes in conjunction with the work done with the babies. It is, of course, a difficult matter for large institutions to maintain a sufficient staff of follow-up nurses to see all

their cases, especially those living at a distance from the hospital, and, as already stated, it is a difficult matter for many of these patients to make personal visits to the hospital for examinations, but it ought to be possible to overcome these difficulties in most instances. Recommendations cannot be made in a general paper of this kind that would be suitable for individual institutions, and this matter must be left to the indications demanded by each particular case. Hospitals with patients residing in their immediate vicinity ought not to have any difficulty in bringing them back for subsequent observation on stated days, when a clinic in charge of a physician could provide for the necessary examinations. This is excellent training for the younger men who would learn by repeated observation on the same patient the course of involution after labor and other postpartum conditions. Many of the simpler lesions can be immediately corrected and those of a gross character kept under observation for possible future operation.

Such reformation of the accepted routine of obstetric hospital facilities as I have suggested will undoubtedly mean in most cases additional equipment and services that hospital managers may find it difficult to acquire under present conditions. But if it is the privilege and duty of our specialty to supervise the process of gestation from the time of conception through the delivery, this must also include the entire puerperal period, and a revised conception of the length of the latter beyond the usual ten days must be made to prevail.

Hospital standardization is the cry of the hour and in so far as this applies to obstetric institutions, it must be made to take cognizance of the fact that responsibility toward the recently delivered woman does not cease with her discharge on the tenth or twelfth day, and the shortcomings of institutional work apply with equal force to private practice.

There is another phase in discussing the question of appropriate and longer postpartum care to which in conclusion attention may be directed. Sociologists have seen, perhaps before the medical profession, the advantage of proper and more prolonged care after childbirth and have sought to attain this end through the medium of compulsory maternity insurance developed under state auspices. That the working classes might benefit by a scheme whereby a period of recuperation after labor could be secured is a question that must be given serious consideration, and much as we may have in general revolted against all plans of compulsory state health insurance thus far proposed as too paternalistic, socialistic and un-American, some modification of such plan may prove a desirable means of lowering the morbidity and mortality of childbearing. The subject is one that the profession may well consider from the standpoint of constructive rather than destructive criticism.

During the last decade the development of standards for prenatal care has marked a great advance in our specialty in which we were led or goaded, perhaps, by certain lay influences, but in conclusion I may venture a prophesy and hope that the next decade or two will witness an equal acceptance of the fact that more prolonged and studied observation of the postpartum period is a part of the responsibility which as conscientious physicians we owe to our patients.

INDICATIONS FOR OPERATION IN SPREADING PERITONITIS OF POSTABORTAL AND POSTPARTAL ORIGIN*

BY JOHN OSBORNE POLAK, M.Sc., M.D., F.A.C.S., BROOKLYN, N. Y.

POSTPARTAL and postabortal peritonitis originates in the pelvis, from the inoculation by infective organisms of wounds in the genital tract or by extension of endometrial inflammations along the tubes or through the parametrium to the pelvic peritoneum. Because of the peculiar anatomy and lymphatic distribution of the female pelvis, the infection usually remains confined to the serous coats of the pelvic structures and the parietal peritoneum.

From an extended study of the autopsy findings in patients dying from postabortal and puerperal conditions, as well as from many observations made at the operating table in cases of postpartal and postabortal pelvic inflammation, we have been impressed with the complete anatomic isolation of the pelvis which generally obtains. This is favored by the routine employment of the elevated trunk posture of Fowler, which has become so universal in the conservative treatment of pelvic infection.

The similarity of the anatomic findings has been constant in every case where the uterine fundus did not reach out of the pelvis beyond the confines of the loop of the sigmoid. It mattered not whether the inflammatory reaction was confined to the true pelvis, or had extended upward into the general cavity. Nature's attempt at isolation was always present, varying only in its completeness. Peritonitis of postabortal or gonorrheal origin generally remains confined to the pelvis unless the infecting bacteria are particularly virulent, or the tissue resistance is low, or unless Nature's plan of isolation is disturbed by meddlesome manipulation on the part of the attendant. There are several reasons why this pelvic localization of the inflammatory process takes place. First, because the infection reaches the peritoneum through either the tubes or parametrium, and consequently the peritoneal reaction is either due to the leakage from the abdominal ostium of the tube, or the exudative infiltration which takes place through the serous coat of the tube or of the parametrium. The tubes through which much of the infective material escapes because of their increased weight, early drop into the culdesac of Douglas, and therefore deposit their infective material and exudate low in the pelvis, and necessarily the most active peritoneal reaction is at or near this point. Second, the peritoneal reaction usually remains localized when the uterus is within the confines of the pelvis, for the sigmoid falls over the infected area and becomes adherent to the uterus, bladder, fundus and parietal peritoneum, thus isolating the infected pelvis from the general cavity. (Figs. 1 and 2.) On the other hand, in puerperal peritonitis, the primary seat of the infection is in the uterine endometrium which in turn is drained by the uterine and parametritic lymph channels. These pass along through the uterine wall to the

*Read by title at the Forty-fifth Annual Meeting of The American Gynecological Society, Chicago, May 24-26, 1920.

perimetrium or in the cellular tissue of the broad ligament and excite a parametritic reaction and empty into the iliac and lumbar glands. If the infecting organism is virulent but little localization is produced and the infection rapidly reaches the peritoneum, but when a parametritis is excited, there is a subperitoneal edema of the overlying serous coat. This distorts and displaces the peritoneal endothelium and allows the inflammatory exudate to be poured out between the cells into the peritoneal surface. These surfaces owing to the high

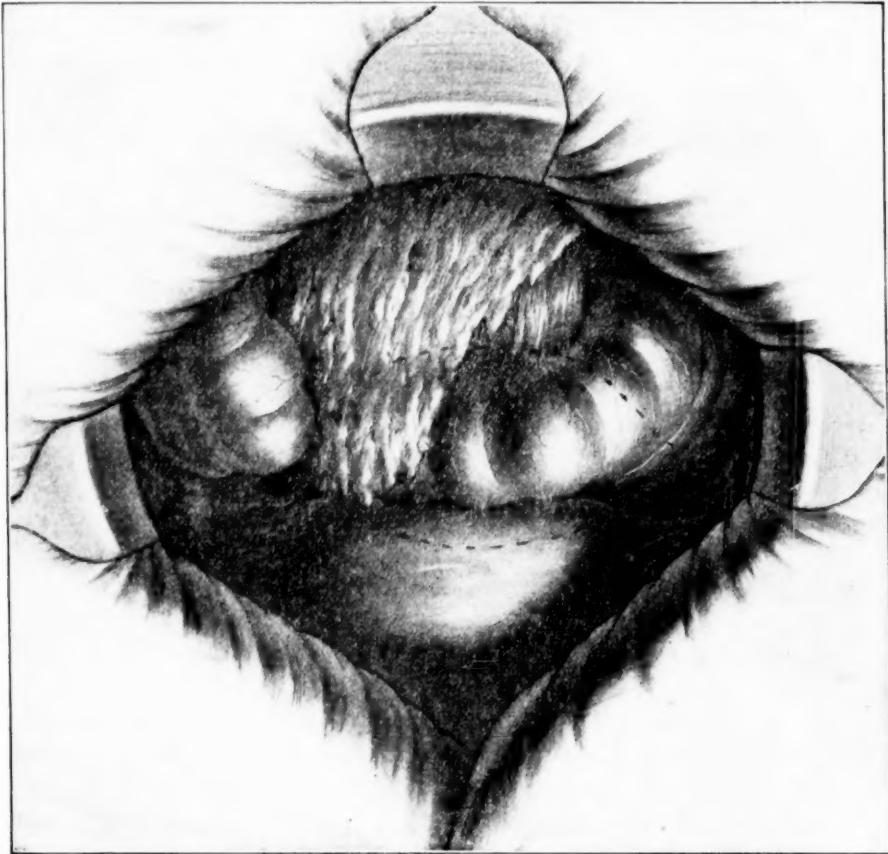


Fig. 1.*—View of viscera through abdominal incision, showing isolation of the pelvis by inflammatory adhesion of the sigmoid, omentum and cecum to the fundus of the bladder.

position and the size of the puerperal uterus come in contact with intestinal coils, and furthermore, the pelvic brim is blocked by the ball-valve action of the enlarged uterus and gravity drainage is interfered with. Hence the exudate as it is poured out, instead of gravitating downward into the true pelvis, is poured out into the spaces between the intestinal coils forming adhesions; or if the exudate is virulent, ascending into the general cavity. Therefore it will be seen that there is a distinct difference in the pathology in postabortal and gonorrheal peritonitis with the uterus well within the confines of the pelvic

*Illustrations in this paper are from "Pelvic Inflammation in Women" by John Osborne Polak, M.D. —D. Appleton & Company, New York, N. Y., 1921.

brim, and the pathologic changes which may take place in the peritonitis complicating the puerperal state.

Ordinarily when the infection reaches the peritoneum a tissue reaction takes place in this structure and a plastic exudate is poured out. This usually seals off the general cavity from the infected area by the formation of adhesions with the adjacent viscera. During this reaction there is always an elevation of temperature, and an acceleration of the pulse rate, a leucocytosis and a relative increase in the polymorphonuclear percentage with more or less abdominal distention, abdominal tenderness and local tension directly over the inflamed area.

Under proper treatment such as the Fowler posture, an ice-bag over the abdomen, morphine and proctoclysis, the general symptoms gradually subside, unless the pelvic isolation is incomplete as is the case when the puerperal uterus with its perimetrial exudate is well out of the true pelvis, or the bacterial invasion is so overpowering as to overcome the leucocyte and plastic reaction. In which case instead of the abdominal symptoms subsiding, evidence of extension

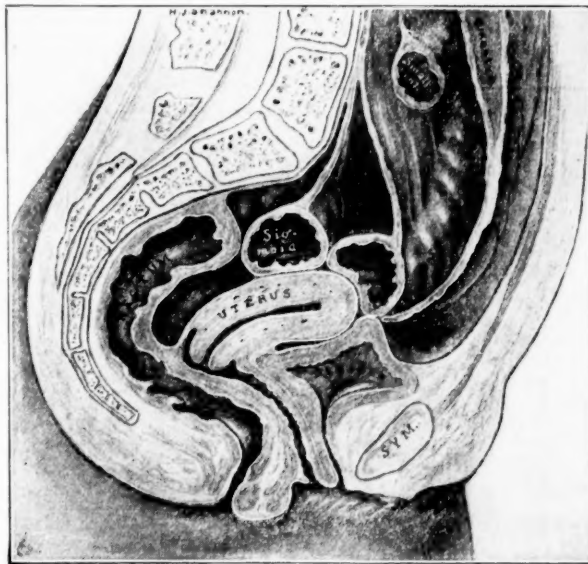


Fig. 2.—Schematic sagittal section showing relations in Fig. 1.

becomes apparent. This is manifested by an increase in the abdominal pain due to peritoneal reaction and increased peristalsis, and an increase in the area of abdominal tension and distention.

There is also an increase or a persistence of the temperature reaction and an increase in the rapidity of the pulse rate. But far more important than these clinical evidences of extension is the increase in the polymorphonuclear percentage. This is always increased in spreading peritonitis no matter how high the leucocytosis may be. When this symptom-complex; namely, the increase in abdominal pain, tension, distention and polymorphonuclear percentage is present, conservative treatment should cease and drainage should be promptly established. Whether this drainage should be made through the culdesac of Douglas or through

a stab-wound incision, must be determined by the type of case with which we are dealing.

In the postabortive and gonorrheal type, free culdesac incision usually results in the escape of thin, cloudy, blood-stained serum; for when the uterus is not sufficiently enlarged to block the pelvic brim, the Fowler posture will allow

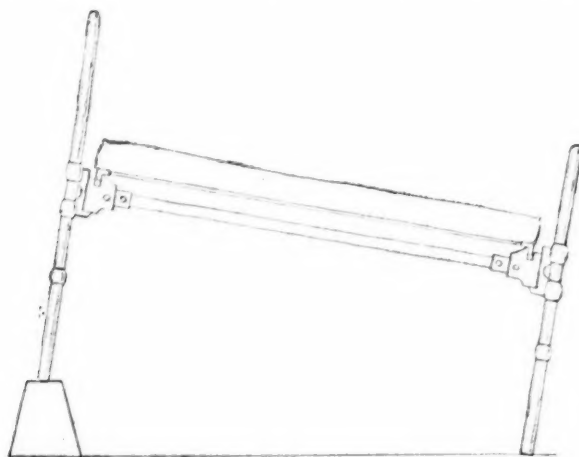


Fig. 3.—Elevated trunk posture, using the ordinary bed.

this virulent exudate to gravitate into the lowermost part of the peritoneal sac; namely, the culdesac of Douglas, and consequently culdesac drainage will relieve the patient from absorption of toxins by the lymphatics of the peritoneum. Such drainage is usually sufficient to give nature the necessary assistance in isolating the pelvis from the general peritoneal cavity.

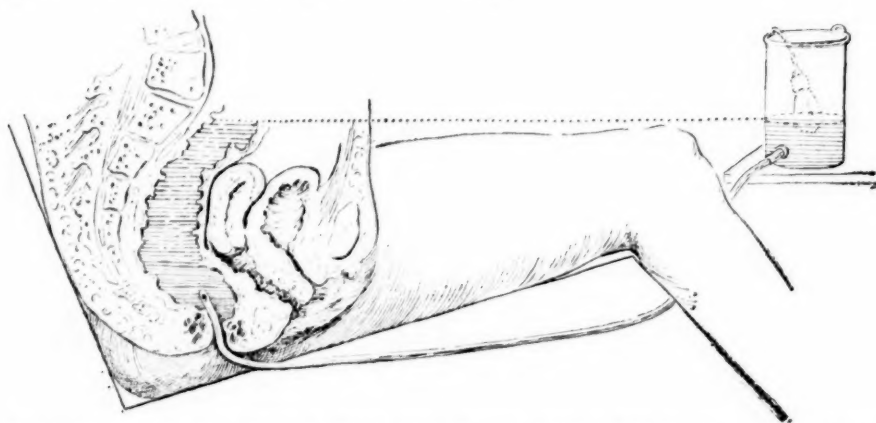


Fig. 4.—Harris drip with patient in Gatch frame showing level of fluid in reservoir and sigmoid.

In other words, in an early spreading peritonitis of this type, by early culdesac drainage we are able to change what is becoming a general involvement into a local pelvic peritonitis or pelvic abscess.

On the other hand, in puerperal peritonitis with these same evidences of extension if the pelvic brim is blocked by the ball-valve action of the large puerperal uterus, culdesac drainage does not offer the same advantages.

While we have felt for years that but relatively few puerperal deaths were due to peritonitis, yet there is a sufficient number of these infections in which the peritoneum is involved, in which there is a distinct place for the employment of the surgical principles of drainage. The expectant treatment of puerperal peritonitis has such a high mortality, owing to the peculiar physiologic and anatomic changes which take place in the blood and lymph channels during the pregnant state, that the absorption of toxins and the resulting toxemia both from within and without the intestines play havoc with the individual resistance and deprive the patient of nourishment, fluid, and oxygen. The heart muscle

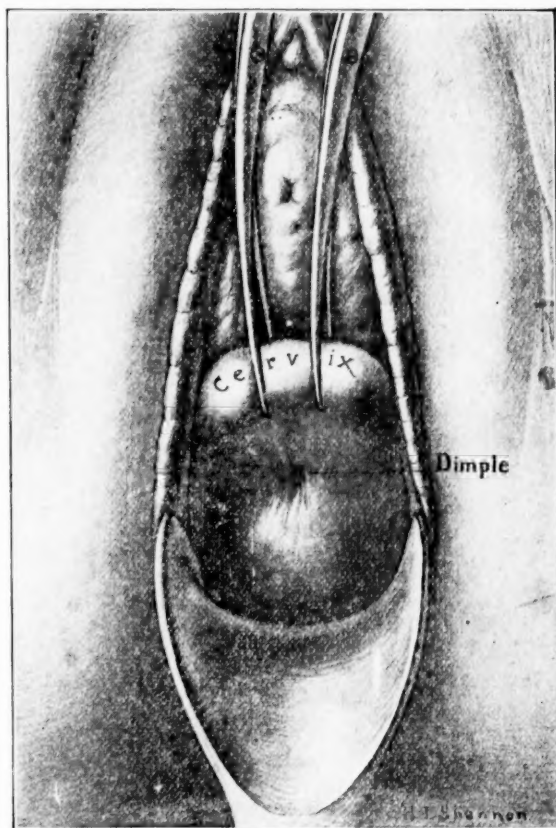


Fig. 5.—Technic of posterior vaginal section. Cervix drawn forward with tenacula, showing dimple at point of incision.

is likewise poisoned so that the blood pressure falls and there is general disfunction of the emunctories. Consequently any procedure which offers an improvement in our results should be tried with courage and conviction.

During the past two years we have treated twelve cases of spreading peritonitis of postabortal and puerperal origin with abdominal drainage. In the first two we were not sufficiently clear as to our indications and the drainage was resorted to rather later than in our subsequent cases. One of these patients died. In the next ten, where the significance of the symptom-complex already referred to was more fully appreciated, drainage was promptly established on

the demonstration of the high polymorphonuclear percentage. Six women recovered and four died. This gives us a total recovery of seven out of the twelve cases treated, which is certainly more encouraging than that of any previous method of treatment.

Our general plan of management of these cases has been as follows: On admission to the hospital after a careful history has been taken which always suggests the origin and course of the infection, the patient has a detailed physical examination which includes inspection of her general appearance, tongue, facies, peripheral circulation and abdominal contour. The heart and lungs are next examined and the blood pressure and pulse pressure taken. The abdomen

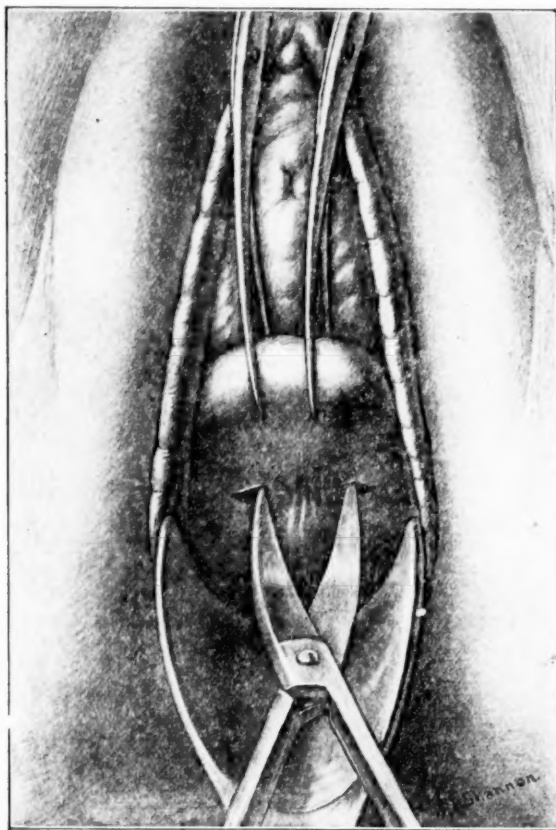


Fig. 6.—Posterior vaginal section, showing incision through the mucosa.

is next palpated to determine the degree of distention, tension and local areas of tenderness. A complete blood count is made, and likewise a blood culture. The patient is then placed in the high Fowler (Fig. 3) position; one or more ice-bags applied to the abdomen and a proctoclysis by the Harris method (Fig. 4) of glucose-bicarbonate of soda solution begun. The pain is relieved by a routine morphinization, small doses being given hypodermically at regular intervals, and the pulse, temperature, respiration, leucocyte count, and polymorphonuclear percentage recorded. If the patient's resistance is capable of taking care of the peritoneal invasion, in twelve to twenty hours there will be a definite recession

in the severity of the symptoms and a fall in the polymorphonuclear percentage. On the other hand, if her resistance is insufficient, or the virulence of the invading organism greater than the protective reaction; the pulse, temperature, and local abdominal symptoms will remain stationary or increase in severity; and most important of all, the polymorphonuclear percentage will rise. In the presence of these conditions drainage is imperative. One does not need to find a palpable exudate in the culdesac before making a posterior vaginal incision through the fornix. (Figs. 5, 6, 7, and 8.) Such an incision in the presence of the symptom-complex such as already described in postabortal cases will usually

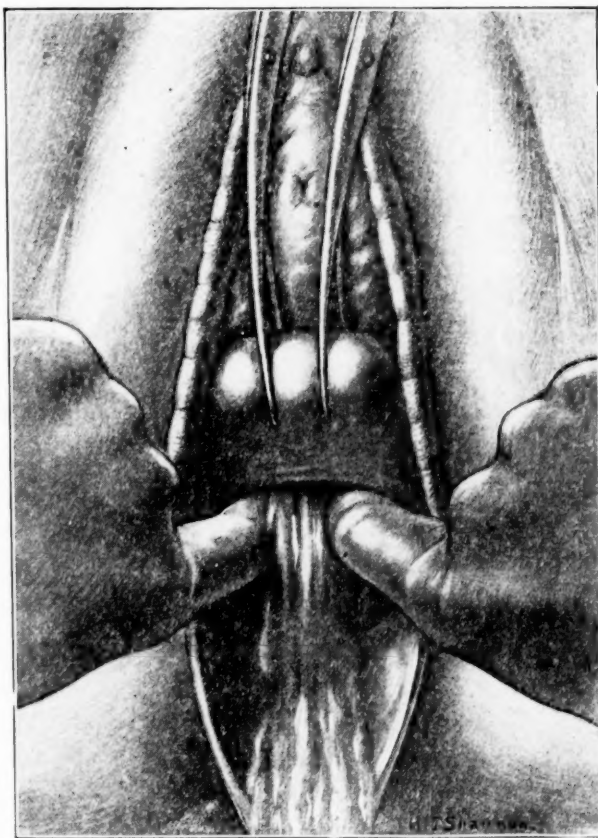


Fig. 7.—Colpotomy incision widened by fingers.

be rewarded by the liberation of a pint or more of thin, flocculent blood-stained serum which on culture returns numberless streptococci. This is also the case if the uterus is reasonably well involuted and within the confines of the pelvis. If the uterus is large, extending beyond the brim, stab-wound drainage just above the pubis and the introduction of a tube or cigarette drain behind the uterus, which is brought out through the abdominal incision, with stab-wound incisions and drainage in both loins, just external to the ascending and descending colon, will frequently give prompt relief by the release of the peritoneal exudate. After these incisions have been made the usual treatment of peritonitis, namely,

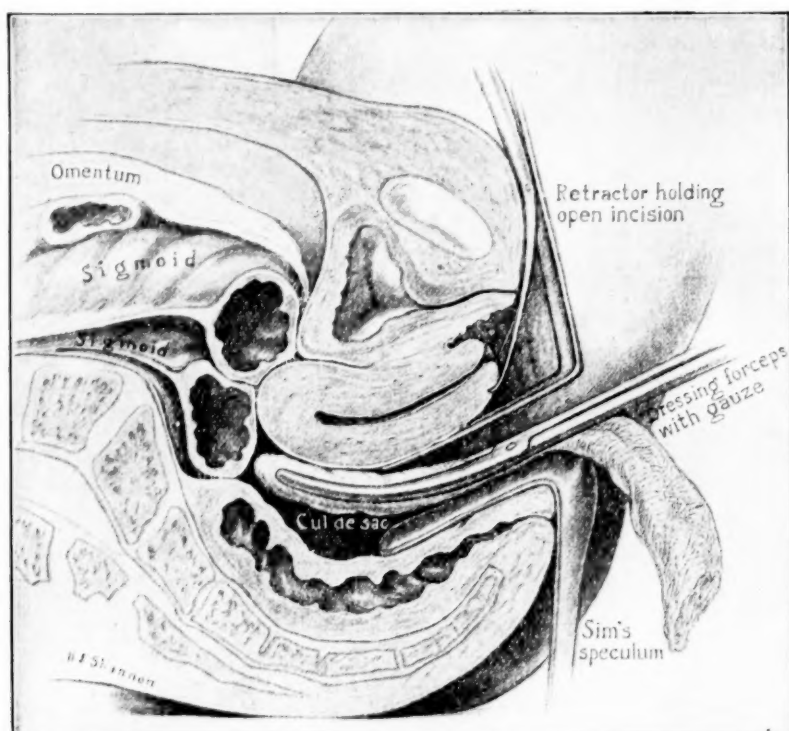


Fig. 8.—Schematic section of pelvis showing introduction of gauze into culdesac between two retractors.

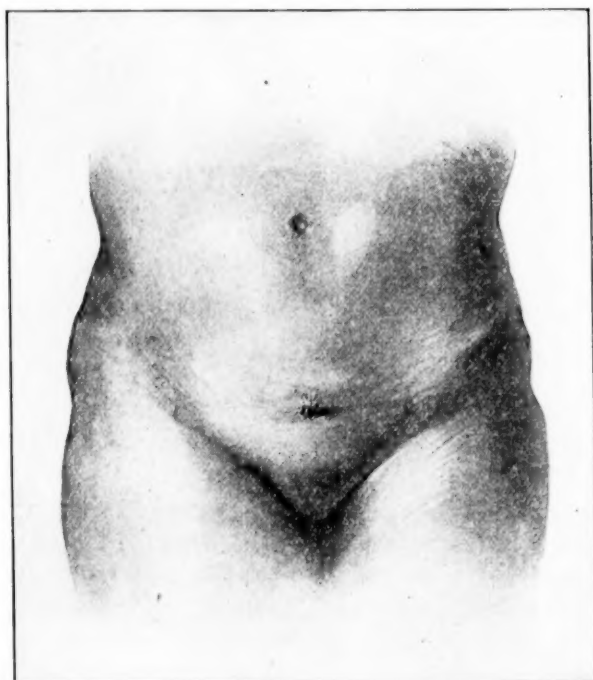


Fig. 9.—Showing site of suprapubic stab-wound drainage.

posture, proctoclysis, starvation, lavage and intestinal rest by morphinization must be continued until the tension is relieved, the intestinal distention subsides, normal peristalsis is established and the temperature, pulse, and polymorphonuclear percentages fall. When this has been accomplished, our drainage has succeeded, and not until these clinical evidences are apparent should any food or nourishment be allowed by the stomach.

From our observations in the clinical study of postabortal and puerperal peritonitis we have drawn the following conclusions: First, that nature is competent to localize the lesions in the large majority of peritoneal extensions. Second, that advancing peritonitis has a definite symptom-complex which is constant when the inflammation is spreading. Third, that in the presence of this symptom-complex drainage is necessary and definitely lowers the mortality.

287 CLINTON AVENUE.

ERRORS IN GYNECOLOGIC DIAGNOSIS DUE TO MISPLACED ORGANS*

BY REUBEN PETERSON, M.D., F.A.C.S., ANN ARBOR, MICH.

PROGRESS in obstetrics and gynecology is denoted, among other things, by greater accuracy of diagnosis. When mere opening of the peritoneal cavity, more often than not, meant death from general peritonitis much thought and time was spent on preoperative diagnosis. When it was demonstrated beyond doubt that by proper precautions the peritoneal cavity could be invaded with impunity preoperative diagnosis of gynecological, pelvic and abdominal conditions became less accurate and often were not made at all. It has been so easy to excuse our intellectual laziness in diagnosis by saying that it makes no difference since the correct diagnosis will be made after the abdomen is opened.

We all know this is false reasoning. In certain cases the diagnostic abdominal incision is directly contraindicated and may shorten the life of the patient, even if immediate death does not result. Poking around in the pelvic and abdominal cavities trying to make a diagnosis in a few moments when such diagnosis could have been made prior to operation by modern diagnostic methods is crude surgery and should be done away with.

The present paper was suggested by a recent case, rare to be sure, but easily diagnosticated had it been approached systematically and not hastily and carelessly. It is the same story with the other four cases which will be reported. In each the correct diagnosis could have been arrived at fairly easily, had the histories and physical signs been more carefully considered and analyzed.

Case 1. Prolapse of right Fallopian tube through colpotomy incision mistaken for a granuloma. Removal of piece for diagnosis followed by severe hemorrhage.

Mrs. H. J. A., aged 29, married, was operated upon in June, 1918, for a large pelvic abscess occupying principally the right side of the pelvis. The posterior culdesac was widely incised, the abscess emptied and the sac drained. The patient made a good recovery and gained thirty pounds in weight after leaving the hospital.

She was examined January 10, 1920, for local pain and tenderness. Since the previous operation she has never recovered her health. She tires easily and is unable to do her work.

Bimanual examination showed both appendages adherent and tender. The uterus was enlarged and fixed in the pelvis. At the site of the previous posterior colpotomy incision to the right of the median line could be felt an adherent irregular mass the size of the end of the little finger. Through the speculum the mass was seen to be irregular and reddish, like a coxcomb. The conclusion was that the mass was probably a granuloma at the site of the old colpotomy incision. In order to be more certain a small piece was snipped

*Read at the Forty-Fifth Annual Meeting of The American Gynecological Society, Chicago, May 24-26, 1920.

off with the scissors. A sharp hemorrhage followed which could only be checked by gauze packing. However, even with this evidence the tissue was thought to be granulomatous until the pathologist, Doctor C. V. Weller, reported the removed tissue to be a portion of the Fallopian tube.

January 28, 1920, the abdomen was opened and the microscopic diagnosis confirmed. The right ovary was bound down by adhesions in the posterior culdesac while a third of the fimbriated end of the tube projected through the vaginal wall and was adherent to the walls of the aperture. The right tube and ovary and the left tube were removed. The patient made a good recovery.

Here was a case in point. There was no reason why a clinical diagnosis should not have been made had greater care been taken in the examination. It is no excuse to say that owing to the situation of the prolapsed tube in the vault of a long and rigid vagina it was difficult to secure a good exposure of the prolapsed tube. It was the business of the examiner to overcome such difficulties. The bleeding subsequent to the removal of the section of the tube should have aroused suspicion that the tentative diagnosis of granuloma was probably incorrect. A granuloma when incised does not bleed as did the tube. Although the correct diagnosis was arrived at prior to operation, there was no intellectual satisfaction on the examiner's part connected with it because it was made by the pathologist.

The case also illustrates the peculiar trend of our minds when trying to arrive at diagnosis of unusual conditions. I knew this was an unusual case since I had never seen an adherent mass like this subsequent to a colpotomy although I have performed a good many hundred for purulent collections within the pelvis. Instead of carefully and systematically considering all the findings in this case whereby a correct diagnosis might and probably would have been arrived at, I jumped at conclusions and held to these conclusions until they were proved absolutely wrong by the microscopic examination.

The same thing will be found to be true in practically all the cases of errors in diagnosis which follow. The correct diagnosis could have been made in each instance if the facts in the examiner's possession had been carefully and systematically considered. As has been well said it is not lack of but a failure to use our knowledge that leads to mistakes in diagnosis.

So far as this particular case is concerned a fairly careful search of the literature fails to show a similar case reported. The nearest approach to it is prolapse of the appendages through rupture of the posterior vaginal wall. Cousins in an address on ovarian hernia and the protrusion of the appendages through rupture of the vaginal wall has thoroughly covered this subject and reports quite a few cases. The misplacements of the organs in his cases, are preceded by quite a different history. According to Breisky the rupture of the vaginal wall occurs almost exclusively in labor or during the puerperium. Grenser reports a case in which a pregnant woman suffering from ascites had a prolapse of the retroverted uterus and appendages through a tear in the posterior vaginal vault. Cousins reports a prolapse through a ruptured posterior vaginal wall of the ovary and tube in the case of an insane patient suffering from uterine prolapse due to persistent straining effort on the part of the patient who had suffered for some time from uterine and rectal prolapse.

It would seem at first glance as if prolapse of the ovary with the tube would be easier to diagnosticate than where the tube is prolapsed alone. However this is mere conjecture. The main thing to bear in mind is that prolapse of the appendages is possible after incision or rupture of the posterior vaginal wall.

MISPLACEMENT OF THE KIDNEY

There may be either a congenital or acquired misplacement of the kidney and in either condition the organ whether normal or diseased may lead to errors in diagnosis. This is well shown by a review of the literature where the kidney has been reported as mistaken for ovarian tumor, solid or cystic, fifteen times, cystic or solid tumors of the tube alone or with other organs fourteen times, solid or cystic ovarian growths with the possibility of other organs beside the kidney being involved six times and hematometra five times.

The following case illustrates how easily hydronephrosis may be mistaken for an ovarian cyst.

Case 2.—Cystic kidney situated in the median line, apparently arising from the pelvis mistaken for an ovarian cyst.

Mrs. S., aged sixty-four, widow, was admitted to the hospital November 18, 1903. The menopause had been established sixteen years. She has always been in fair health up to the beginning of the present trouble. Three months ago she was told she had a tumor, although she thinks her trouble started a year ago with pain in the right side and lumbar region. At times she is sick at the stomach and has pressure symptoms and pain at stool.

Examination showed an extremely thin woman with marked atheromatous arteries. The abdomen is regularly distended by a mass which reaches from the pubes to the epigastrium. The tumor is slightly more prominent on the right than the left side. On the right it reaches to the anterior superior spine and extends upward to the border of the ribs, on the left it is within two fingerbreadths of the anterior superior spine and almost to the border of the ribs. The umbilicus protrudes. The growth is smooth, elastic in feel, and apparently is cystic. The percussion note is flat on the right but somewhat tympanitic on the left side. By vaginal examination the tip of the finger just reaches the growth at the brim of the pelvis. The uterus is atrophic, the appendages not made out.

The diagnosis was cystadenoma of the right ovary and the patient was operated upon November 19, 1903. On opening the peritoneum a blue walled cystic tumor presented. The peritoneum was in front of the tumor, the cecum to the left and overlapping the growth. The cystic mass was found to arise from the right flank and was unconnected with the pelvis. The left kidney was palpated and found to be normal in size and position. The peritoneum was incised and the cystic kidney removed. The patient made a good recovery.

Here again were all the facts for making a correct diagnosis had they been put together in the proper manner. There was a distinct history of pain in the right side and flank, unusual, to say the least, with cystadenomata. Moreover, it was exasperating to have dictated the finding that there was decided tympany over the left side of the tumor yet to have made no use of such data because the conclusion was jumped at that one was dealing with the very common cystadenoma.

A history of pain in the flank must always be regarded as indicative of the renal origin of cystic neoplasms until the contrary has been proved. To-

day it is the surgeon's duty to make a preoperative diagnosis in every cystic abdominal or pelvic growth. If there be a distinct history of the pelvic origin of the growth and if the abdominal and pelvic findings confirm the diagnosis of an ovarian cystadenoma, it may be unnecessary to make use of other methods of examination in the differential diagnosis. In all doubtful cases, however, it is absolutely essential in the interests of good surgery to employ all urological methods to establish the diagnosis.

The cystoscope may reveal no urine coming from the ureteral orifice on the suspected side or it may show the urinary flow to be continuous in contrast with an intermittent flow from the other orifice thus denoting hydronephrosis with or without intermittent hydronephrosis.

In doubtful cases it is essential to employ the functional tests after ureteral catheterization in order to determine the integrity of each kidney. The same may be said as to the value of pyelography in difficult or obscure cases.

A review of the literature shows that in the large majority of cases where cystic kidneys were mistaken for ovarian cysts, the preoperative diagnoses could have been made had the examiners given more consideration to the possibility of the growths being renal in origin.

Curiously enough, notwithstanding the lesson learned from the above case which I spoke of many times in my clinics when the differential diagnosis of ovarian cysts was under discussion, one of my former assistants, Doctor Ward F. Seeley, during my absence made the same error in diagnosis as follows.

Case 3.—Enormous cystic left kidney reaching from the pubes to the ensiform mistaken for an ovarian cyst.

Mrs. G. L., aged forty-seven, entered the University Hospital, February 10, 1915, complaining of enlargement of the abdomen of four years' standing. Four years ago she discovered a firm solid mass, the size of a grapefruit in the lower left abdominal quadrant. During the four years there has been a gradual increase in the size of the abdomen but no symptoms aside from the inconvenience of the enlarging abdomen. There were no fever, chills, nausea, vomiting or jaundice. The general health was excellent.

Examination showed the patient of moderate frame and good nutrition with an abdomen enlarged especially in the lower left quadrant. The highest point of the swelling is three inches below and to the left of the umbilicus. Palpation shows the tumor apparently arising from the pelvis and filling the left lower abdominal quadrant. It reaches almost to the ensiform and extends well into the right upper and lower quadrants. The mass is freely movable and easily displaced to the right side of the abdomen. The smaller upper pole of the mass is firm and hard, the larger lower pole is distinctly cystic. The tumor is easily palpable through the posterior culdesac and gives a distinctly cystic feel to the examining finger.

The diagnosis of multilocular ovarian cyst was made and the patient operated upon February 16, 1915. At operation the uterus was found displaced backward by a cystic tumor which extended from the pelvis to the ensiform. Both ovaries were normal. The colon was stretched over this mass which was retroperitoneal and arose from the left kidney. The right kidney was palpated and found normal. The cystic kidney was aspirated and 2200 c.c. of fluid removed. The kidney was removed in the usual manner and the patient made a good recovery.

This case was quite similar to the other case of hydronephrosis except the disease was of longer duration and the cystic destruction of the kidney much greater. It shows how easy it is to be mistaken in the origin of a cystic mass a part of which lies in and can be palpated in the pelvis. It also illustrates how important it is to outline carefully the uterus and appendages as an aid to diagnosis. Rectal examination is often very valuable in such cases and should always be used in the presence of cystic growths no matter how simple the diagnosis may appear.

The history of a round mass in the left lower quadrant four years before entrance to the hospital should have aroused suspicion that the origin of the growth might be elsewhere than in the ovary. At times the patient may be mistaken regarding the time of appearance or the early location of the growth but usually such testimony is valuable since if the patient is intelligent enough to notice a growth she is apt to have fairly accurate information regarding it. At least her story should be given credence until proved by other findings to be inaccurate. More often it is the examiner's fault in that he approaches the case with preconceived ideas of the diagnosis based upon findings pointing to a common disease leading to a scant consideration of points in the history which may be all important.

Aside from a cystic kidney which may be mistaken for an ovarian cyst, the movable or floating kidney or the congenital pelvic kidney may give rise to errors in diagnosis. Movable kidney is met with so frequently in women that the examiner is almost always on the lookout for it, therefore, recognizes the condition by the usual signs. In rather exceptional cases where the movable kidney lies within the pelvis it may give rise to confusion until doubt is solved by replacement into its position in the flank.

Movable kidney with torsion may be hard to distinguish from an ovarian cystic or solid tumor with a twisted pedicle. The pain, however, when the pedicle of a movable kidney is twisted is located in the renal or epigastric region, while the pain of a twisted pedicled cyst is lower down and there is more general peritoneal involvement.

In case of doubt it is easy to settle definitely whether the tumor be renal by ureteral catheterization or the x-ray.

The congenital pelvic kidney being more uncommon and immovable as a rule is more apt to be either overlooked or mistaken for a genital tumor. The following case illustrates such an error.

Case 4.—Pelvic kidney in a woman without a vagina mistaken for hematometra and punctured through an incision made between bladder and rectum.

Miss M. Z., aged seventeen, single, was examined June 23, 1911. The patient has always been healthy with the exception of never having menstruated. There has never been anything suggestive of menstruation, either a discharge of blood from the vagina or menstrual molimina, until Christmas, 1911, when she had a spell during which she felt very nervous, blue, and very irritable. Although she had no particular pain she was obliged to go to bed for three weeks. There have been a number of similar attacks since during which there has been a dull ache in the lower abdomen but no sharp pain.

Examination showed a well-developed and well-nourished girl, perfectly normal so far as the breasts, pubic hair, and feminine characteristics were

concerned. The clitoris and labia were normal but there were no signs of an introitus. The meatus urinarius admitted the tip of the little finger with ease and there was some eversion of the mucous membrane. Rectal examination failed to reveal with distinctness either uterus or appendages but did show a globular mass just at the end of the examining finger.

The conclusion was at once arrived at that the condition was one of hematometra and on June 27, the tissue between the rectum and bladder was dissected upward for a distance of three inches through a transverse incision. At this distance the mass could be distinctly made out and with the idea of emptying the uterus of blood and establishing a communication with the outside a scalpel was thrust upwards into the mass. The result was not as expected for upon withdrawing the scalpel there was a terrific hemorrhage, the bright red blood differing greatly from retained menstrual fluid. The hemorrhage was so sharp that it could only be stopped by tight gauze packing. The diagnosis now was plain, absence of vagina and uterus together with a pelvic kidney. For a number of days samples of the urine showed large amounts of blood which gradually diminished. On July 5, an artificial vagina was formed by means of flaps taken from the labia and buttocks. The patient married soon afterward and the vagina was found serviceable.

At the risk of being tiresome, it is again pointed out that the error in diagnosis was due to the same causes which led to the mistakes in the three previous cases. So sure was I that I was dealing with retained menstrual blood that I proceeded to empty the uterus in a manner which might have led to fatal results. There is very little satisfaction in having the diagnosis in a case like this thrust into your face. To be sure the woman did not die from the hemorrhage, but this was due to no foresight on my part.

All this could have been avoided by raising the query as to whether the pelvic tumor might not be renal in origin and determining the exact position of the kidney or kidneys by modern methods.

Cullen reports an almost similar case of a right pelvic kidney, absence of the left kidney, absence of vagina and uterus and both ovaries in the inguinal canals. The diagnosis of hematometra was made and the tissues between bladder and rectum dissected for a distance of five inches. Then doubt was thrown upon the diagnosis and the abdomen was opened showing the true condition of affairs.

Engstroem made a diagnosis of hematometra in a young girl of seventeen who lacked vagina and uterus. Laparotomy showed a pelvic kidney and the operation was completed by removal of both adnexa, an unjustifiable procedure in the light of our present day knowledge.

Von Kubinyi reports the case of a girl of nineteen who had never menstruated. Rectal examination showed the presence of a round tumor thought to be a hematometra. The tissue between the bladder and anus was dissected up to the peritoneum. As the tumor could not be reached from below the abdomen was opened and the tumor found to be a sacral kidney.

Buss removed a pelvic tumor from a girl of twenty-one who showed absence of vagina and had suffered from colicky pains, the original diagnosis having been hematometra. The patient died in seven days from uremia and microscopic examination of the removed tumor showed it to be a kidney. The other kidney was not found at the autopsy.

Other cases have been reported of death following the removal of pelvic kidneys showing the danger of such procedures as congenital anomalies are liable to be multiple. In the light of our present knowledge suspicion should at once be aroused as to the renal nature of any mass in the pelvis where absence of the vagina, in whole or part, exists. Again it may be stated that it is an absolute necessity to obtain complete information regarding the genitourinary apparatus before any operation is attempted.

MISPLACEMENT OF THE SPLEEN

The so-called wandering spleen has given rise to more errors in gynecologic diagnosis than has the movable or pelvic kidney. A partial review of the literature shows that wandering spleen has been mistaken for an ovarian tumor, cystic or solid, thirty-five times; ovarian tumor or some other genital organ, six times; uterine tumor, seven times, with other scattering mistakes in diagnosis.

The diagnosis of wandering spleen may be easy or exceedingly difficult dependent upon the size of the woman afflicted, the position of the spleen, and whether it be movable or fixed by adhesions. The difficulty of diagnosis is illustrated by the following case where the diagnosis was not made until after operation.

Case 5.—Wandering spleen adherent in the pelvis and resting upon the retroverted uterus, mistaken for a uterine fibroid. Removal and recovery.

Mrs. E. W., aged thirty-nine, married, was admitted to the University Hospital November 8, 1901. The patient was very obese, weighing in the neighborhood of 300 pounds. Her present trouble dated from the age of nineteen when she had a severe fall. For months she was unable to walk and suffered from severe pain in the lower abdomen. The attacks seemed to have no connection with the menstrual periods. Abdominal and pelvic examinations were extremely difficult on account of the obesity of the patient. However, a pelvic mass, more solid than cystic, could be indistinctly made out in the lower abdomen rather more to the right than the left. The mass was quite tender and rested upon the retroverted uterus. A diagnosis was made of probable uterine fibroid and to save the obese patient a laparotomy, if possible, the anterior culdesac was opened. A large adherent mass could be felt just at the tip of the finger, resting upon the retroverted uterus. Its size preventing removal through the vagina, the abdomen was opened by an incision reaching from the pubes to the umbilicus. The tumor was found to be a displaced spleen adherent to the vesicoparietal peritoneum with its lower surface resting upon the retroverted uterus. The pedicle was ligated and the spleen removed. The patient made a good recovery and showed no ill effects from the removal of the organ, her symptoms being entirely relieved.

Displacement of the spleen is not uncommon in women, especially married women during middle life. If the spleen be displaced but nonadherent the diagnosis is not especially difficult if one keeps in mind the possibility that the spleen, like the kidney, may be movable. When it has been displaced and is adherent in the pelvis or at the pelvic brim the diagnosis may be extremely difficult, as in the case just reported, where it was thought to be a uterine fibroid. I have removed solid fibroid tumors of the ovary shaped

not unlike a spleen with a notch in the middle of the growth. It is not always easy to palpate the splenic notch in wandering spleen since the organ as it descends from its normal position tends to become horizontal and the notch to be drawn backward and upward. These facts, together with the increase in size of the spleen due to edema and congestion, can give rise to frequent errors of diagnosis so far as palpation is concerned.

Unless the peritoneal surface of an ovarian cyst or pedunculated uterine fibroid is or has been the seat of infection, there will be no tenderness on palpation, in contradistinction to the prolapsed spleen which, without torsion of the pedicle or evidence of peritoneal inflammation, is quite sensitive on palpation.

A study of the reported cases of wandering spleen shows that the condition cannot be excluded because a mass lies to the right of the median line. On the contrary, such a spleen can occupy any position in the abdomen or pelvis in which a tumor of the right or left ovary may be found.

Where the pedicle of the spleen has become twisted the difficulties of diagnosis become increased since the pain and sensitiveness may be the same in degree and location as when the pedicles of tumors of the genital organs become twisted. As in the case of cystic and solid tumors of the kidney the history may be of the greatest value in the differential diagnosis of wandering spleen. A history of a fall or injury and the slow gradual descent of a mass from under the left ribs should always arouse suspicion as to the possibility of a tumor being a wandering spleen.

It appears as if the new method of abdominal diagnosis, pneumoperitoneum, where the outlines of the abdominal and pelvic organs are shown by the x-ray after the injection into the peritoneal cavity of nitrous oxide or carbon dioxide gas, holds out the greatest possibilities regarding the diagnosis of wandering spleen. If this method of diagnosis, after its technic has been perfected, fails to show the spleen in its normal position, but shows a tumor elsewhere, it is strong evidence that the tumor is splenic no matter what the position or whether it be adherent or free.

Other misplaced abdominal organs have led to errors of gynecologic diagnosis. For instance, Chadwick reports a most interesting case where a prolapsed stomach was aspirated through the posterior culdesac under the impression that a pelvic abscess was being emptied. In two instances the enlarged and prolapsed liver has been mistaken for an ovarian cyst, while the prolapsed enlarged gallbladder has been incorrectly diagnosed as ovarian cyst in at least five cases. However, such errors of diagnosis will be merely referred to since I have no personal cases to record.

CONCLUSIONS

1. Mistakes in gynecologic diagnosis arising from misplaced organs are not uncommon as shown by the literature in which only a small proportion of such mistakes is probably recorded.

2. Such errors in diagnosis arise from either carelessness, or preconceived ideas of diagnosis whereby important facts in the history and equally important physical findings are either overlooked or ignored.

3. Such diagnostic errors can be averted by greater care in systematically considering with a free mind the facts in the case relating to the history and physical findings provided the latter are obtained through the employment of the most modern methods of examination.

4. In every case a preoperative diagnosis should be made and recorded in order to profit by mistakes revealed at the operation or autopsy.

BIBLIOGRAPHY

- Breisky: Rupturen der Scheide. Billroth and Luecke, *Deutsche Chir.*, 1886, lx, 90.
Buss, O.: Zur Dystopie der Niere mit Missbildung der Geschlechtsorgane (irrtümliche Exstirpation der ins kleine Becken verlagerten einzigen Niere). *Ztschr. f. klin. Med.*, 1899, xxxviii, 439-450.
Chadwick, J. R.: Seven Cases of Congenital and One of Traumatic Stenosis or Atresia of the Female Genital Canal, *Boston Med. and Surg. Journ.*, 1886, cxiv, 505-509.
Cousins, J. W.: An Address on Ovarian Herniae and the Protrusion of the Appendages through Rupture of the Vaginal Wall, *Brit. Med. Journ.*, 1895, ii, 185.
Cullen, T. S.: A Right Pelvic Kidney. Absence of the Left Kidney; Absence of the Uterus; Both Ovaries in the Inguinal Canals, *Surg., Gynec. and Obst.*, 1910, xi, 73-75. *Am. Journ. Obst.*, 1910, lxii, 296.
Engström, O.: Ueber Dystopie der Niere in klin.-gynäkologischer Beziehung. *Ztschr. f. klin. Med.*, 1903, xlix, 25-44.
Grenser: Interessanter Fall von Retroversio uteri. *Monatschr. f. Geburtsh.*, 1857, ix, 73.
v. Kubinyi, P.: Künstliche Scheide bei gänzlichem kongenitalem Scheidendefekt, kombiniert mit Uterus rudimentarius und sakraler Niere. *Festschr., Budapest. Klin. Also (Abst.): Zentralbl. f. Gynäk.*, 1910, xxxv, 302.

620 FOREST AVENUE.

(For discussion, see p. 211.)

THE TREATMENT OF PREGNANCY AND LABOR COMPLICATED BY CARDIAC DISEASE*

BY FRANKLIN S. NEWELL, M.D., F.A.C.S., BOSTON, MASS.

SO far as can be determined from statistics, approximately 2 per cent of all obstetric cases are complicated by definite valvular disease of the heart, more or less serious in degree, which renders the prognosis somewhat doubtful, either in the immediate pregnancy or in the years to come. When the patients who are suffering from myocardial change, whether acute, following some recent infectious process, or chronic, are included, it seems fair to assume that about 3 per cent of all parturient women have a cardiac condition which may be expected to react more or less seriously to the strain which pregnancy and labor impose on the heart. There is probably no obstetric complication which calls for greater judgment on the part of the attendant than do cardiac lesions, since not only the immediate prognosis for mother and child, but the future health of the mother depends on the proper conduct of pregnancy and labor.

The obstetrician is not infrequently called on to decide whether the risks of pregnancy and labor are too great to be undertaken by a patient who is known to have a heart lesion or whether pregnancy may be undertaken with a reasonable chance for an immediately successful outcome for both mother and child, and without serious danger that the mother may be left a cardiac invalid at an early date. More commonly, however, he is consulted when the pregnancy is already an established fact and the question to be answered then is whether the pregnancy must be terminated at an early date for the sake of saving the life or health of the mother or be allowed to continue, in the absence of serious symptoms, to, or nearly to, full term. If he decides, after due consideration, that it is unwise to allow the pregnancy to go on, the method to be adopted for the termination of pregnancy has an important bearing on the future life and health of the patient. In the cases where the continuation of pregnancy seems justifiable, the care given the patient during pregnancy and the method of delivery at term have an important bearing not only on the immediate life of the patient, but also on her future. The decision of the obstetrician in the individual case is evidently, therefore, not a simple matter, since an error of judgment may involve the loss of the maternal life or health, or result in forbidding childbearing needlessly to a woman who would gladly run some risks for the sake of having a child, if there is any method of treatment by which the risks can be so minimized as to be justifiable.

The cardiac patient who attempts pregnancy must be considered as a relatively unfavorable risk, even under the best conditions. Cardiac damage is inevitable, since the cardiac reserve will be depleted to some extent by the additional strain imposed on the heart, and the pregnancy must be so con-

*Read by title at the Forty-fifth Annual Meeting of the American Gynecological Society, Chicago, May 24-26, 1920.

ducted as to give the best chance for a favorable result for both patients, while delivery must be so accomplished as to impose the least possible strain on the damaged heart. It is not enough for the obstetrician to take into account a successful result in the immediate pregnancy, but he must bear in mind the fact that the strain of pregnancy is a serious one and that his patient's future health depends largely on the care which she receives. He must, therefore, take into consideration the effect which the strain of pregnancy and labor will have on the damaged heart in the years to come as well as at the present time, and so conduct the case that the cardiac reserve shall be depleted to the least possible extent.

Before considering the methods to be adopted in the care of the individual case certain facts must be accepted as true if the patient is to be given the best chance for a favorable result. First, no matter what the nature of the cardiac lesion in the given case, the increased strain which pregnancy and labor unavoidably impose on the damaged heart must diminish to a certain extent the cardiac reserve and thus to a greater or less degree shorten the patient's life. The damage may be such as to result in death or chronic invalidism unless the pregnancy is terminated early and the child sacrificed, or it may be slight in degree and only become evident as the patient grows older. But in my opinion every patient with a cardiac lesion who attempts childbearing must pay some price in length of days for each child, the exact amount being dependent on the nature of the cardiac lesion, the condition of the heart muscle at the beginning of pregnancy and the success with which the heart is protected from all unnecessary strain during pregnancy and at the time of labor.

Second, it is impossible to estimate accurately the extent of the damage which will result to the heart from the strain of pregnancy, even under the best conditions, in spite of the most careful consideration of all the factors present in the individual case. My experience has shown that in two patients with an apparently equal degree of cardiac damage, which seems to be perfectly compensated under normal conditions, one will develop more or less serious symptoms during pregnancy and labor, while the other will pass through the strain without developing any unfavorable symptoms. I believe that there are no accurate means of determining the effect of the pregnancy on the heart and it is exceedingly difficult to formulate an accurate prognosis for the given case. I can recall several instances in which the results, both good and bad, have proved so widely at variance with the opinions expressed by competent internists after careful study of the patient that I am convinced that the only fair prognosis which can be given to a cardiac patient is that more or less damage to the heart will result from the attempt to have children, and that her life will be shortened to some extent, but that the actual degree of damage in the individual case cannot be estimated in advance. There are, of course, certain patients in whom the cardiac history, taken in conjunction with the physical findings, is such that it is evident that childbearing will either prove fatal or leave the patient a chronic invalid, and in these cases pregnancy should either be forbidden, if the obstetrician

is consulted in advance, or should be interfered with promptly as soon as the facts are clearly appreciated. In the majority of cases, however, a patient—if otherwise in good health, without a history of previous decompensation and whose heart muscle is presumably sound—can be advised that in all probability pregnancy can be undertaken, under proper supervision, with an excellent chance of an immediately successful result, but that the strain on the heart will cause some damage which will ultimately shorten her life, though to what extent it is impossible to predict accurately. Therefore, it is a question for the patient to decide herself, whether she is willing to pay an indefinite price for the sake of having children, the exact amount being largely determined by the care with which pregnancy and labor are conducted. There is always, however, an element of uncertainty, and relatively favorable cases, even under competent supervision, sometimes go badly.

It has been a long established tradition of the medical profession that if a patient with a cardiac lesion consults her physician as to the advisability of pregnancy, she should be strongly cautioned against it. If the only problem to be determined in the given case were the prolongation of the patient's life to the utmost extent this advice would be sound, since there can be no question but that the avoidance of all possible strain on the heart will do more to conserve its reserve than any other method of treatment. There are, however, many women with cardiac lesions who feel that life is incomplete unless they have children, and who, while not willing to sacrifice their life or immediate health to gratify this desire, are perfectly willing to shorten their lives to a greater or less extent. In advising these cases as to the justifiability of attempting pregnancy, the judgment of the obstetrician is often taxed to the utmost. The nature of the lesion, the history of the patient as regards symptoms of previous decompensation, the probable condition of the heart muscle, and the care which the patient is able and willing to receive, both during pregnancy and at the time of labor, must all receive due consideration before proper advice can be given to the individual patient.

Experience has shown that certain lesions are more seriously affected by pregnancy than others. Of these, mitral stenosis, either alone or in combination with other lesions, is distinctly the most serious. The aortic lesions come next in order, and mitral regurgitation, while not entirely negligible, is of relatively minor importance. If myocarditis can be demonstrated, the seriousness of the prognosis is definitely increased. If a patient has never had any signs of decompensation either in her ordinary life or in previous pregnancies and has suffered no limitation of her ordinary activities on account of the cardiac lesion, the outlook for a successful pregnancy with a minimum of damage is good. If, however, there have been previous attacks of decompensation, or if the patient develops symptoms referable to the heart on what would be ordinary exertion for the healthy woman, the prognosis is to say the least doubtful, and pregnancy should be advised against, irrespective of the nature of the lesion. If a patient's circumstances are such, other conditions being satisfactory, that she can take proper care of herself during pregnancy in order to minimize the damage to the heart and can command such

obstetrical skill at the time of labor as to save the heart from undue strain, pregnancy is often justifiable, whereas if the opposite were the case, pregnancy should be absolutely forbidden. Furthermore each patient must be informed that if cardiac symptoms unexpectedly arise during pregnancy in spite of careful supervision, a prompt termination of the pregnancy will probably be necessary, even in apparently favorable cases, and that under such circumstances a sufficient degree of cardiac damage may result to render her a cardiac invalid to a greater or less extent, even though the pregnancy be ended in the early months. Under these conditions it is fair to advise a cardiac patient that it is justifiable for her to attempt childbearing, but otherwise it should be absolutely forbidden.

In most cases, however, pregnancy is already a fact when the patient consults her physician for care, and the problems which he has to decide are first whether a continuance of the pregnancy is justifiable, and if not, by what means is it best terminated; second, if continuance of the pregnancy seems wise, what routine shall the patient adopt to minimize the strain of pregnancy on the heart; and third, how shall she best be delivered if pregnancy is successfully accomplished.

The question as to whether the pregnancy should be allowed to continue or must be terminated promptly depends on several factors. Some authorities go so far as to say that the discovery of a mitral stenosis is sufficient indication for immediate abortion, while others feel that heart disease is not a contra-indication for pregnancy and labor. Neither position is correct as is evidenced by the fact that many patients with a marked mitral stenosis or an aortic lesion go through pregnancy with little apparent damage and regain their ordinary health after delivery, while on the other hand in a certain proportion of cases cardiac decompensation develops, which sometimes results in death or invalidism even though a patient is given the best possible care. It is evident, therefore, that the problem is one which must be settled for each individual patient, and no rule can be laid down.

If a patient with mitral stenosis or aortic disease has never had symptoms referable to the heart (at least of a severe character), and the heart is performing its work properly when the patient applies for advice, such a patient should be placed on a definite routine, the purpose of which is to remove all possible strain from the heart, and the pregnancy should be allowed to go on under close observation, interference being only advisable in case symptoms develop. This is particularly true in patients who have had the cardiac lesion for a considerable period of time and have suffered no disability from it. If, however, the patient when under proper supervision has suffered attacks of decompensation, if when she applies for care the heart is already causing symptoms, or if her normal activities have in the past been seriously hampered on account of the heart, a patient should be advised that it is unwise to allow the pregnancy to go on, since a serious failure of compensation may develop at any time with possibly fatal results.

If abortion seems advisable the method of operation is of considerable importance. It seems to me that a termination of the pregnancy is only a partial

operation in these cases since it leaves the patient in a condition to again become pregnant with the necessity of future abortions, and, therefore, I believe that unless the patient's condition is such as to contraindicate an abdominal operation the abortion is best accomplished by abdominal hysterotomy. Sterilization should be performed at the same time to obviate the danger of future abortions, since the necessity of terminating one pregnancy for cardiac reasons should be considered as an absolute contraindication to future pregnancies.

I believe it is little, if any, more dangerous for a patient with a bad heart to be delivered in this way than to have the uterus emptied from below, and the advantage to the patient of being permanently protected against pregnancy, which is considered a serious menace to her life, is considerable. If the patient is suffering from an attack of decompensation at the time when abortion is decided on, every effort should be made to restore compensation before the uterus is emptied. If compensation can be restored, the obstetrician has a choice of several methods for emptying the uterus, but I believe that the abdominal route under general anesthesia is the preferable method, irrespective of the period of pregnancy. If, however, it proves impossible to restore satisfactory compensation, there is no question in my mind but that delivery by abdominal hysterotomy, under local anesthesia, preceded by morphine and scopolamine is the most satisfactory method. Such patients are poor risks for any of the general anesthetics and will occasionally die as the result of their use. Paravertebral anesthesia has in my hands proved a very exhausting method to such a patient, although it produces satisfactory anesthesia, and I should hesitate to employ spinal anesthesia on a patient with a decompensated heart on account of the marked changes in blood pressure which accompany it, though this feeling may not be based on sufficient grounds.

The results which I have had in Cesarean section at term and earlier with local anesthesia, preceded by morphine-scopolamine, have convinced me that this is the most satisfactory method for use in patients whose cardiac condition contraindicates a general anesthetic, and the operation is as easily performed on a patient three or four months' pregnant as at term, being completed by sterilization. The patient is thus delivered and protected against the dangers of future pregnancies at a single operation.

The employment of the morphine-scopolamine preliminary to operation under local anesthesia, has, in my experience, proved most satisfactory, the patient not infrequently having no recollection of the operation. In preparation for the operation the patient is given gr. $\frac{1}{6}$ of morphine and 1/200 gr. of scopolamine two hours before the time set for operation, the scopolamine being repeated two or three times at thirty to forty minute intervals until the patient is asleep. The patient's eyes are covered and her ears plugged with cotton before she is brought to the operating room. No unnecessary noise is permitted in the operating room. The abdominal wall is injected with one half per cent novocain, it being only necessary to prepare the skin and fascia. Neither the parietal nor visceral peritoneum requires treatment. An interval of at least ten minutes should elapse between the injection of the novocain and the beginning of the operation. If sterilization is to be performed

the uterine portion of the broad ligaments should be anesthetized before the tubes are excised from the uterine cornua. I have found that by strict attention to detail cardiac patients who are often excessively nervous and hard to control can be brought to operation in a perfectly quiescent state and commonly have no recollection of the operation.

If it is decided that the patient is a fair risk for pregnancy, the pregnancy should be allowed to go on under close supervision. All possible strain should be avoided; active exercise, especially hill climbing and going up the stairs, should be eliminated so far as possible. The general hygiene, fresh air, diet, etc. should be carefully regulated. The bowels should be regulated. The urine should be examined at weekly intervals so that any signs of passive congestion may be discovered early. The patient should be instructed to take a two-hour rest in bed every day, and to supplement this by spending one day a week in bed during the early part of pregnancy and two days a week during the last three months. The blood pressure should be carefully followed, and a rise in blood pressure should cause grave concern on account of the extra burden thrown on the heart, and may be sufficient to warrant an abortion. Digitalis or other cardiac stimulants are to be used if any signs of failing compensation occur. Digitalis may be employed to advantage in all cases in the last months of pregnancy and the rest periods may be extended if desirable.

If patients are thus kept under close supervision, any signs of cardiac distress will be discovered early and can be met by increased precautions in the majority of instances. If, however, the cardiac symptoms do not subside promptly, and especially if they show any signs of increase, immediate termination of the pregnancy is called for to limit the cardiac damage. This rule should be an absolute one if the pregnancy is less than six months' duration, since the attempt to prolong the pregnancy for several months in the hope of obtaining a living child in a patient whose cardiac condition is showing signs of failure under proper care is almost sure to result disastrously and is not justifiable. In patients six months' or more advanced in pregnancy in whom the cardiac symptoms, though definite, are not alarming, an attempt may be made to carry along the pregnancy to viability if a sufficiently high value is placed on the child by the mother, so that she is willing to run the risk of serious invalidism for the sake of a living child. The patient must, in these cases, be practically confined to her bed throughout the remainder of the pregnancy, and cardiac stimulants should be used as indicated. Delivery should be accomplished by Cesarean section under general or local anesthesia as soon as the child is believed to be sufficiently developed to live, in order to minimize the cardiac damages as far as possible, local anesthesia being the choice, if the cardiac symptoms are at all marked, and sterilization to avoid future pregnancies is advisable. Interference is seldom indicated in such cases before the 36th week, unless urgently demanded by the cardiac condition, since so much has already been sacrificed by the mother for the sake of the child that its chances should be guaranteed as far as possible. It must not be forgotten that if the mother suffers from severe decompensation the child frequently dies as a result. Therefore, if the cardiac symptoms appear threatening, it is seldom

or never justifiable to attempt to prolong the pregnancy for a problematical advantage to the child.

As a general rule in these cases I believe that the abdominal route should be selected, irrespective of the time when interference is advised, and that the patient should be sterilized to prevent the possibility of future pregnancies. The choice as to whether the operation should be done under a general or a local anesthetic depends on the degree to which compensation can be restored before the operation is performed, but operation under local anesthesia may well be applied to all cardiac cases who have developed any signs of decompensation.

The strain on the heart increases in all as the end of pregnancy approaches, and if we can spare the heart two weeks or more of this increasing burden the prognosis for the patient's future will be better than if she is allowed to go to full term. Moreover in any cardiac condition which has given rise to symptoms, even though compensation has been completely restored, this strain should be lessened so far as the interests of the child permit. In all cases in which a definite decompensation has developed during pregnancy it should be recognized that future pregnancies are absolutely contraindicated, and that the possibility of chronic invalidism in the near future is a definite one at the best, even in the absence of all avoidable strain. Should pregnancy occur again in such cases the danger to life and health is greatly increased and prompt abortion is indicated. For this reason sterilization is advisable.

The pregnancy should be ended by the method which will throw the least possible strain on the heart, which is, in my opinion, Cesarean section, under general or local anesthesia, according to the condition of the heart when operation is considered advisable, and the preferences of the individual operator. I believe firmly that by this method of treatment the damage can be limited as far as is possible by any method, but any failure of compensation during pregnancy means that considerable harm has been done, even though compensation may have been restored by treatment, and that the patient's future is doubtful at the best. The more serious the decompensation the worse the outlook for the patient, and the earlier will she become a cardiac invalid.

Such patients must be advised that pregnancy should be under no circumstances again attempted, and sterilization at the time of the present delivery should be strongly advised, since by this method only can the possibility of pregnancy be absolutely precluded. In the cases in whom abortion is indicated in case conception occurs at a later date no chances should be taken.

If the patient goes through the pregnancy without developing any signs of decompensation, the method of delivery is of great importance and will vary in the individual patients with the nature of the heart lesion, the number of the pregnancy, and the estimated difficulty of labor. In primiparae with mitral stenosis, or with an aortic lesion, delivery should, in my opinion, be accomplished by Cesarean section, preferably about two weeks before the estimated date of labor so as to spare the heart the increasing strain of the last weeks of pregnancy. There is no doubt that in the majority of cases a carefully guarded labor ended by an operative pelvic delivery as soon as the cervix is fully dilated

will give immediately satisfactory results, but the strain of labor on the damaged heart will to some extent deplete its reserve and the future prognosis will be improved if the strain of labor is avoided. In these cases there is no reason for sterilizing the patient unless she requests it, owing to the fact that if she is willing to pay a certain price for one or more other children her experience during this pregnancy warrants her in undertaking the risk. In multiparæ who have had no signs of decompensation during pregnancy or at any other time I believe that a short, first stage labor, delivery to be accomplished by forceps or version as soon as the cervix ceases to be an obstacle, will give nearly as good results, but the length of labor in primiparæ, especially if examination gives any reason to suppose that the labor will be at all a difficult one, will throw such strain on the heart as to render an abdominal delivery the wisest course and ultimately result in unnecessarily shortening the patient's life. It is not a question in my mind of the immediate result, but of conserving the cardiac reserve so as to lessen the possibility of the patient's becoming a cardiac invalid in the years to come.

In patients with mitral regurgitation which has never caused any symptoms, I believe that the only precaution necessary is to avoid the strain of the second stage of labor by prompt delivery as soon as the cervix is fully dilated.

The same principles should be followed in patients who are believed to have myocardial change, although no definite heart lesion can be demonstrated. The condition of the heart muscle is even more important than the question of a valvular lesion, and in patients who are suffering from symptoms suggestive of myocarditis, whether acute or chronic, all possible strain should be taken off the heart. This is best accomplished by abdominal delivery at a fixed date, thus avoiding the strain which labor imposes on the heart.

I recognize that this method of treating cardiac patients may be criticized; that it may be said with truth that statistics do not warrant the assumption that young women with cardiac lesions are in so precarious a condition as to warrant such radical methods of treatment. The results obtained in any lying-in hospital, as shown by the records, will apparently prove that the great majority of patients with definite cardiac lesions will pass through pregnancy and labor without serious symptoms, and that it is only in the occasional primipara or in the woman who has had repeated pregnancies, perhaps against advice, that immediately serious results occur. I believe, however, that this is a case in which the hospital records only tell a part of the story. It is recognized that some patients with cardiac lesions, previously apparently in good health, either die during pregnancy and labor, or are left as cardiac invalids as a result of the strain. In my opinion it is impossible to predict accurately which patients will do well and which will suffer severely as the result of pregnancy. Furthermore the follow-up system of our lying-in hospitals has not been sufficiently developed to tell us what the future of these patients may be. I have seen a sufficient number of patients who have passed through one or more pregnancies without serious disaster only to become permanently invalided within a few years, to be absolutely convinced that it is part of the duty of the obstetrician to safeguard his patient's future by every means in his power.

I feel therefore that the line of treatment which I have attempted to outline in this paper will do more to safeguard the future health of a patient and at the same time allow her the joy of one or more children than any other method of treatment, though, of course, I will admit that the most conservative of all methods of treatment is to forbid pregnancy to every woman who has a cardiac lesion, and to advise abortion if pregnancy occurs.

443 BEACON STREET.

THE USE OF BLOOD TRANSFUSION IN OBSTETRICS AND GYNECOLOGY*

BY HERVEY C. WILLIAMSON, M.D., NEW YORK, N. Y.

BY the use of modern procedures, blood transfusion has come to be a valuable asset in our accepted methods of treatment. Its importance has now been established beyond controversy. It is particularly valuable in the treatment of hemorrhages, shock due to hemorrhage, secondary anemia, and certain blood dyscrasias.

Pemberton,¹ in the introductory sentences to an excellent history of transfusion, says: "The history of the development of the operation of transfusion of blood is an interesting record of alternate triumph and failure. History is replete with evidence that from early time man's imagination has been stirred by the possibility of restoring health, vigor, and even youth to the aged and infirm by replacing blood of young and healthy." Physicians for several generations have been interested in this topic, but in our present-day conception, it is only of value to restore health.

In this article there is also described an apparatus for transfusion used by Blundell in England in 1818, which consisted of a syringe, two-way stopcock and receptacle. The principle is the same as used for our transfusions. Seven of Blundell's transfusions were performed on women suffering from loss of blood due to childbirth. Of these three were successful.

That obstetricians realized the value of transfusion is attested by the fact that Braxton Hicks² reported six cases in 1869. These were done during pregnancy or parturition, but unfortunately all died. He suggested phosphate of soda as an anticoagulant and gave directions for its use. Losee,³ in 1919, again showed the value of this procedure in obstetric work.

In transfusion there are two general principles: First, the giving of unaltered blood, and second, the use of blood so altered by sodium citrate that it will not coagulate.

As to the relative value of unaltered or citrated blood, the opinions of various writers are of interest. Unger⁴ believes that one of the differences between unmodified and citrated blood is manifested by more frequent occurrence of reactions with the latter method. He writes: "For diseases in which blood is indicated for itself, that is, when it is required as a tissue, as in the various anemias, especially when the disease is hemolytic in nature, there can be no question as to the relative merits of unmodified blood which runs almost from vessel to vessel and that which has been handled, chemically altered and allowed to remain for an indefinite time outside the body. The transfusion of unmodified blood is the procedure of choice."

Garbat,⁵ on the other hand, concludes a paper on blood transfusion as follows: "One hundred transfusions by the citrate method have been per-

*Read at a meeting of the New York Obstetrical Society, April 13th, 1920.

formed for various disturbances and the favorable results compare almost absolutely with those attained by other authors using unmixed blood. It should, therefore, except only in special instances, be adopted as the routine method, since both the clinical and the laboratory findings support this view."

Pemberton,⁶ while not comparing the two, writes, in discussing transfusion for bleeding: "It is of interest that, clinically, the use of an anticoagulant in the transfused blood not only does not retard the coagulability of the recipient, but possesses an equal power of hemostasis with the undiluted blood administered by the syringe-cannula method."

When choosing a method, one must consider the facility with which the blood can be given. There are two methods by which unaltered blood has commonly been given: First, the direct, by uniting the artery of the donor to the vein of the recipient (or the vein to vein); and second, the indirect, or syringe-cannula method. The direct method has never been popular for two reasons; it is difficult and tedious, whether the vessels are sutured or cannulas used, and there is no known way of accurately measuring the amount of blood given. The second, or indirect, method for giving whole blood, either by Lindeman⁷ syringes or with a two-way stopcock apparatus like the Unger,⁸ is at present the best. By either of these methods the blood can be rapidly given and the dosage accurately measured.

One great advantage of the citrate method is its ease of performance for any one familiar with venipuncture. Several procedures have been devised, in fact any salvarsan apparatus can also be used. A simple method will be described in this paper.

For the majority of cases that require transfusion, the citrate method will prove safe and satisfactory.

A theoretical explanation of the efficiency of sodium citrate to prevent clotting is given by Howell⁹ after Sabbatani: "The calcium salt formed has a very small dissociation constant, so that the concentration of calcium ions is reduced below the minimum necessary to activate prothrombin to thrombin." The rôle calcium plays in clotting is to aid in the formation of thrombin from prothrombin.

That the early transfusion was an exceedingly dangerous proceeding is now well known; this is due to the fact that isoagglutination and isohemolysis had not been discovered.

In matching the blood for these transfusions, a simple method was used. This method was suggested by Dr. James Ewing and has been used at the Memorial Hospital for two years. It is as follows: Two white blood pipettes are used. Rinse them with 10 per cent sodium citrate solution; fill one with blood from the donor two divisions on the stem of the pipette, then to the one (1) mark on the stem with blood of the recipient; then with 10 per cent sodium citrate solution to the eleven (11) mark. The second is filled in the same manner, but the proportion of donor to recipient is reversed. The pipettes are then incubated at 37° C. for five to ten minutes; a small drop is placed on a clean slide, covered with a cover slip and agglutination looked for with the low power microscope. It is important to have a small drop so there

will be no mechanical clumping. If agglutination is present in either pipette, do not take the donor. The first pipette is, however, the most important.

An objection has been raised against this method, namely, that the dilution in the first pipette is too great. (This must be admitted to have a theoretical basis).

Most authors agree that the grouping method is an almost perfect procedure and will not result in hemolysis. That all persons are in one of four groups was first noted by Jansky¹⁰ and later confirmed by Moss.¹¹ The ideal method is to have a number of professional donors grouped so that the proper one can be selected after grouping the recipient's blood. It is well to have several so-called universal donors available at all times.

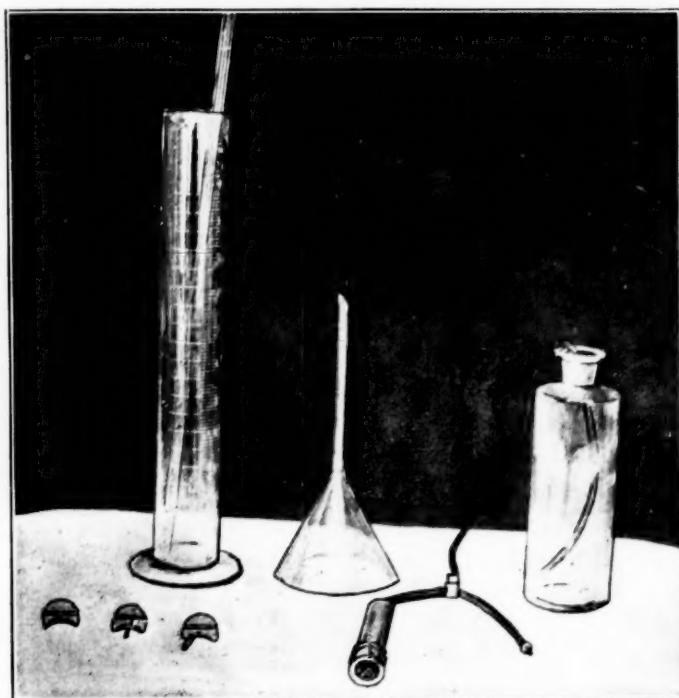


Fig. 1.—Showing apparatus required for the transfusion.

The question of syphilis is obviously a very important one as there are recorded cases of its transmission by blood transfusion. We have selected close relatives so far as it was possible—husband, mother, brother, etc.—and have carefully questioned them for luetic history. The professional donor should always be Wassermann negative and his history for possible recent infection be elicited.

The apparatus used is a salvarsan apparatus and was first shown to me by David MacKenzie, of Montreal. It consists of a bottle, or flask, three-way valve, 20 c.c. Luer syringe, rubber tubing, graduate, funnel, glass rod and cannulas. (Fig. 1.) We have found the Unger cannula very satisfactory. All the apparatus is first rinsed with 2 per cent sodium citrate solution. The blood is

then collected in the graduate from the donor, who may be in the same or adjoining room; or, as in one of our cases, away from the hospital. Ten per cent of the volume of blood desired, of a 2 per cent sodium citrate solution is first added; e. g., 50 c.c. when 500 c.c. is required. The blood, therefore, is in a 0.2 per cent solution of sodium citrate. When inserting the cannula, it is advantageous to insert it first between the skin and the vein, then at a point above the skin opening, enter the vein. This permits a valve-like action and there is little bleeding, even after the use of the large cannula. With a little practice this can easily be done. The blood should be gently but thoroughly stirred during collection to get a good admixture. The blood is then strained through gauze into the bottle, and pumped into the vein of the recipient through the three-way valve, being careful to exclude all air from the tubing.

Attention is called to the following important points:

1. The sodium citrate solution must be freshly made with chemically pure sodium citrate and freshly distilled water. This solution deteriorates.



Fig. 2.—Showing method of injecting by drawing the blood from the bottle into the 20 c.c. Luer syringe, turning the valve, then forcing it into vein of recipient.

2. Rinse all apparatus with the sodium citrate solution.
3. Use a large cannula to secure blood from the donor so that it may be collected quickly. (We have collected 500 c.c. in four and one-half minutes.)
4. Exclude all air from the apparatus by first filling the syringe and tubing with blood.

The advantages of this apparatus for transfusion are: First, its simplicity, one physician and a nurse can operate it; second, the blood can be rapidly or slowly given; third, the blood can be kept at an even temperature by placing the bottle in a basin of warm water.

Pemberton¹² advocates having the blood in 0.24 per cent, Lewisohn¹³ and Garbat,¹⁴ 0.25 per cent solution of sodium citrate. Clotting may occur in a weaker solution especially if the donor has previously given blood. Some clotting occurred in two of our cases, but it was due, I believe, to the fact that the

blood did not flow freely from the donor. The large cannula obviates this difficulty.

The indications for transfusion in this field are:

- I. To replace blood lost from uterine or other acute hemorrhage.
- II. To replace blood and stimulate the hematopoietic system in secondary anemia due to repeated hemorrhages of small amounts and toxemia, or both.
- III. To cure hemorrhagic diseases, especially hemorrhages of the newborn.
- IV. Preparatory to operation.
- V. In toxemia of pregnancy.
- VI. As a prophylactic and curative measure in sepsis.

My observations with this method include eighteen transfusions given to seventeen patients. The obstetric cases were from the service of Dr. J. Clifton Edgar at Bellevue Hospital and Manhattan Maternity and Dispensary, the gynecologic cases were at the Memorial Hospital. They may be grouped according to the indications:

GROUP I. HEMORRHAGE

There were three obstetric cases benefited by transfusion; 375 c.c. of blood was given to one, and 500 c.c. to the others. Hypodermoclysis was used during the operative delivery and this was supplemented by the transfusion. To one case, a partial placenta previa with shock from the delivery, 1500 c.c. of saline was given and 375 c.c. of blood afterward. The red blood count was 3,250,000 with 80 per cent hemoglobin before the transfusion and 3,280,000 with 75 per cent hemoglobin the following day. To another, a forceps delivery followed by postpartum hemorrhage, 1000 c.c. of saline was given and 500 c.c. of blood. The red blood count was 2,170,000 with 45 per cent hemoglobin before the transfusion and 3,010,000 with 70 per cent hemoglobin the following day. The third case was admitted to the hospital with a ruptured uterus. Upon this patient a hysterectomy was performed, and she was given 2500 c.c. of saline during the operation and 500 c.c. of blood afterward. The red blood count was 850,000 with 15 per cent hemoglobin before the transfusion and eight hours afterward 1,856,000 with 35 per cent hemoglobin. The red blood count three days later was 2,892,000 with 50 per cent hemoglobin. For the first three days after operation her condition was very satisfactory. She died on the fourth day and no autopsy was obtained.

In these cases the blood is advantageous for the reason that it supplies, temporarily at least, a functioning tissue, which lessens shock and undoubtedly increases resistance to infection.

There has been no opportunity to transfuse a case of accidental hemorrhage or ruptured ectopic gestation.

GROUP II. SECONDARY ANEMIA

There were six transfusions given to five patients. Four of them had carcinoma of the uterus with an anemia produced by loss of blood plus the toxemia of the disease. With one exception, a very advanced case that died eight days

after transfusion, the results were very satisfactory. In the favorable cases there was an increase of red blood cells ranging from 700,000 to a 1,000,000 and hemoglobin 10 to 20 per cent.

The fifth case in this group was one of hematemesis during pregnancy. Following spontaneous premature delivery she received 500 c.c. of blood and there was no more bleeding. A diagnosis of gastric ulcer was made and she was later transferred to the medical service, where she died twenty days after delivery.

GROUP III. HEMORRHAGIC DISEASES

There were two cases of hemorrhages of the newborn and one of purpura hemorrhagica occurring in a pregnant woman.

The two cases of hemorrhages of the newborn were cured almost immediately by giving respectively, 100 and 75 c.c., of citrated blood. In no other condition was the result so evident. One baby had been oozing continuously from a hypodermic puncture, made by giving toxin-antitoxin for immunization against diphtheria, and this bleeding stopped almost instantly at the conclusion of the transfusion. The other was a typical one of hemorrhage of the newborn and was cured by transfusion into the longitudinal sinus.

The purpura hemorrhagica patient was in the seventh month and received 250 c.c. of blood. No new spots developed and she subsequently was delivered normally of a healthy baby.

GROUP IV. PRE-OPERATIVE CASES

There was only one patient in this group, a case of bleeding uterine fibroid. Four hundred c.c. of blood was given and a bloody vaginal discharge followed.

The value of the transfusion was lost in this instance, for we waited several days before operating and during that time considerable uterine bleeding occurred. We feel, therefore, that in such instances it is better to operate promptly after the transfusion is given.

GROUP V. TOXEMIA

Three patients were transfused for toxemia of pregnancy. One, a severe toxemia of the liver type with pronounced dehydration, received 500 c.c. of blood after an operative delivery. She made a rapid, uneventful recovery and the red blood cells increased from 3,288,000 to 3,776,000 following the transfusion, while the hemoglobin was increased 10 per cent.

Two cases of pernicious vomiting were transfused. In one the transfusion was unsuccessful, as the patient became cyanotic, with rapid, thready pulse after 60 c.c. had been given; the transfusion was then stopped. In the other 250 c.c. was given and, while there was some temporary improvement, in the course of a few days the nausea recurred in a severe form and it was deemed advisable to empty the uterus.

GROUP VI. PROPHYLACTIC AND CURATIVE MEASURE IN SEPSIS

There were two patients transfused. To one the blood was to be given as a prophylactic and to the other, as a curative measure. In the first case the transfusion was discontinued after 40 c.c. of blood had been given, as the pa-

tient became slightly cyanotic, restless, and had a severe backache. The other patient had streptococcus hemolyticus bacteriemia and received 250 c.c. of blood. The infection was severe and she died five days later.

Polak¹⁵ reports favorable results from repeated transfusions of small amounts in bacteriemia and thrombophlebitis.

Excluding the two cases described, where the transfusion was stopped, no reaction was severe. Eleven had no reaction; five had chills, with a rise of temperature from 100° to 102° F. In the septic case the temperature rose from 102° to 102.8°.

REFERENCES

- ¹Pemberton, J. de J.: Blood Transfusion, Surg., Gynec. and Obst., March, 1919, xxviii, No. 3, p. 262.
- ²Hicks, J. Braxton: Cases of Transfusion, with Some Remarks on a New Method of Performing the Operation, Guy's Hosp. Rept., 1869, 3, s., xiv, 1-14.
- ³Losee, J. R.: Blood Transfusion, Am. Jour. Med. Sc., November, 1919, clviii, No. 5, p. 711.
- ⁴Unger, L. J.: The Therapeutic Aspect of Blood Transfusion, Jour. Am. Med. Assn., September, 1919, lxxiii, No. 11, p. 815.
- ⁵Garbat, A. L.: Sodium Citrate Transfusion: A Study of One Hundred Cases, Jour. Am. Med. Assn., January, 1919, lxxii, No. 1, p. 1.
- ⁶Pemberton; Idem.
- ⁷Lindeman, E.: Simple Syringe Transfusion with Special Cannulas: A New Method Applicable to Infants and Adults, Am. Jour. Dis. Child., 1915, vi, 28-32.
- ⁸Unger, L. J.: A New Method of Syringe Transfusion, Jour. Am. Med. Assn., February, 1915, lxiv, 582.
- ⁹Howell, W. H.: Textbook of Physiology, Philadelphia, W. B. Saunders Co., 1918, ed. 7, p. 468.
- ¹⁰Jansky, J.: Abstract. Jahresb. u.d. Leistung u. Fortschr. a.d. Geb. d. Neurol. u. Psychiat., 1907, xi, 1092.
- ¹¹Moss, W. L.: Studies on Isoagglutinins and Isohemolysis, Bull. Johns Hopkins Hosp., 1910, xxi, 64.
- ¹²Pemberton; Idem.
- ¹³Lewisohn, R.: Transfusion of Citrated Blood; Technic and Indications, New York State Jour. Med., 1919, xix, No. 12, p. 431.
- ¹⁴Garbat; Idem.
- ¹⁵Polak, J. O.: A Preliminary Note on the Value of Repeated Small Blood Transfusions in Blood Stream Infections, Am. Jour. Obst., 1919, lxxx, No. 3.

480 PARK AVENUE.

Society Transactions

AMERICAN GYNECOLOGICAL SOCIETY. FORTY-FIFTH ANNUAL
MEETING HELD IN CHICAGO, ILL., MAY 24, 25 and 26, 1920

(Continued from October Number.)

In a **Symposium on Radium Therapy** the following papers were read:

- DR. WILLIAM S. STONE, of New York City, **The Present Position of Radium Therapy as an Educational Factor in the Diagnosis of Uterine Cancer.** (Original article to be published in *Surgery, Gynecology and Obstetrics*.)
- DR. WILLIAM P. GRAVES, Boston, Mass., **Operation or Radium for Operable Cancer of the Cervix.** (For original article see page 122.)
- DR. FREDERICK J. TAUSSIG, St. Louis, Mo., **An Analysis of the Failures in Radium Treatment of Cervical Cancer.** (For original article see page 113.)

DISCUSSION

DR. JOHN G. CLARK, PHILADELPHIA.—I have a series of 30 cases that have lived over three years. The women are apparently well. The first case was treated in 1914, was forty-three years of age, and had previously had an amputation of the cervix, followed by prompt recurrence of the cancer. A previous amputation was done by cauterization. This patient has gone over six years. I gave her up about a year ago as hopeless as she had apparently a recurrence of the disease in the bladder. We reapplied radium. She has gained since then fourteen pounds and has gone back to her work.

The next case of inoperable cancer of the cervix dates back to 1914. Her physician reported a few days ago that she has had no bleeding, no leucorrhea, no pain, and her general health is very much improved. Examination shows she has been in good condition since.

One of the most remarkable cases we have had dates back to 1915. This patient had been operated for deciduoma malignum, with prompt recurrence and a very large mass in the pelvis. We have serial sections of that case. She now drives her automobile. A remarkable thing is she is only 27 years of age. The deciduoma malignum of the vagina was treated first in 1915. I saw her about two weeks ago. There is no trace of recurrence of the disease and she has been entirely well for five years.

Another patient first seen in 1915 is also entirely well. I might go on and repeat several of the cases, but it is hardly necessary to do so.

Up to the present time, in all my personal discussion of the matter I thought it was unwise to dwell upon the question of cure in this sense. I not only hold up to this time but still hold tentatively to the dictum which Dr. Graves has put before you. The astonishing thing is how few operative cases I find nowadays. My statistics show strikingly how the operative indications have steadily diminished. We have in this list a woman who has gone on for five years. She was pregnant, with a cauliflower cancer; the mass was cauterized and radium applied, allowing her to go to term. She went to term and bore a baby. I saw her not more than three or four days ago. She is perfectly well. She has gained four and a half pounds, and she says she feels better than she ever did in her life. She feels that radium made her young again. In spite of the fact that we get serious criticisms for applying radium where a patient has subsequent pain, she gets a radium energy. This case I am going to hold back and hope sooner or later to make an extended report of it.

As to the question of operability, I was interested in Dr. Graves' statistics. I cannot help but feel, when we analyze the ultimate results with the ones now before us, that we will approach them closely, taking into account some of the seriously inoperable cases.

As to fistulae, I have a feeling that we will prevent rather than cause them in a very definite percentage of cases. There is no doubt that we do cause them, but in curing these local growths the patient who is ultimately dying from metastatic extension may escape this catastrophe.

As to the preoperative treatment of carcinoma, I cannot help but feel there is an error in the doctor's paper. It is not based on facts so far as I have them. When he says he has had strikingly good results in the postoperative treatment, that is, where there is recurrence, it seems the wisest possible thing to follow the advice that Dr. Howard Kelly has given, namely, to make radium application before doing a radical operation, then proceed with operation in thirty-six to forty-eight hours before serious changes in the tissue become evident. That is all the disagreement I have to make except to say that I am finding fewer operative cases. That is the basis of my optimism in the cases I have spoken of before.

As to the question which Dr. Taussig brought up, namely, the difficulty of treatment, I do not personally share that feeling. In the first place, I am dealing with small doses and not with large amounts that Dr. Kelly, Dr. Burnam, or Dr. Bailey are disposed to use. I am dealing only with 100 milligrams applications.

Since I have been using large masses of gauze to pack the rectum and vagina out of the way, we have had fewer difficulties than before, consequently I think it is more a matter of distance in getting the tissues out of the way.

As to first and subsequent treatments, my associate (Dr. Anspach) and I have already raised the question whether sometimes we had not treated some of the cases too much. In other words, some of the best cases had been women who had gotten well apparently and would not come back to us as they were in such excellent shape. If we do not get a result in two treatments, we do not try any more.

Another point is attacking hopeless cases with radium: If these women have pain, as they will have if we radiate them heavily, they will blame us for having produced this terrible pain. We are commencing to sift out our first 150 cases. We are sifting out and turning away the perfectly hopeless cases. A large proportion of deaths occur within three months after the application of radium and some of these patients may be dying when they come to the hospital.

DR. ARTHUR H. CURTIS, CHICAGO.—Of all cases seen up to five years ago, namely, 79, the relative curability was 34 per cent of 48 cases operated.

DR. CURTIS F. BURNAM, BALTIMORE.—Radium, with its intriguing possibilities, has turned us towards a much more thorough study of cancer of the cervix. Before the age of radium, I was interested in cancer of the cervix only to the extent of making a diagnosis and determining whether it was operable or inoperable. With radium the possibility of treating successfully, or helpfully at least, extends from the very incipency of cervical cancer to the last stages. Each case presents a problem in itself. It is natural, therefore, that we are all greatly awakened in regard to the study of the progress, development and entire history of this disease.

There are three general methods of applying radium: First, the topical application to the cervix, which is possibly the only way necessary in early, operable cases or, at least, in those operable cases where radium is employed instead of operation. Second, imbedding suitable emanation carrying points directly in the cervix and parametria and into the fixed masses on the pelvic wall which occur in inoperable cancers of the cervix. One can by this technic delay the disease, doing away with pain and in some cases curing, where topical applications yield no results. This method is also applicable in conjunction with operation in the treating of fixed gland metastases, particularly in the iliac groups. Third, trans-abdominal treatment, such as Dr. Bailey and I have used for several years, is a valuable adjunct in the extensive cases and permits of a formal, much more radical technic than that afforded by the topical application alone. To carry this out, however, a distance of at

least 10 cm. from the skin must be used, many skin portals and a large amount of radium, and plenty of time must be available.

Dr. Graves has presented wonderful results—better than we have had in Baltimore and, in many respects, better than most of those which have been published. I wish to congratulate him. I am sorry that neither he, Dr. Taussig nor Dr. Stone considered the different types of cervical cancer and the results in treating these different groups. It is not enough to recognize that there is an adenocarcinoma of the cervix or a squamous cell epithelioma, but it is important to bear in mind that there is a typical basal cell epithelioma of the cervix, which is common, which responds to radium admirably and which is not so likely to be metastatic. There is no danger or difficulty in doing a hysterectomy two or three days after a preliminary radiation, such as one would carry out in an operable case where the two methods are combined. Neither we, personally, nor our colleagues in Baltimore have lost a patient in this way.

Through the interest and courtesy of our confreres in Baltimore, as well as outside the city, we have been able to collaborate in operative and radiation techniques. My impression is that it is much better to radiate before operation and that it can be done more efficaciously.

There is no excuse whatever for vesical or rectal fistulae in operable or early inoperable cancers of the cervix after radium treatment. Where there is an enormously extensive growth and where it is widespread over the vaginal walls, such a complication is sometimes unavoidable. However, it is better to have a resulting fistula, as this may be repaired later, than to die of cancer.

I want to emphasize my feelings that the members of the American Gynecological Society should stand together and should develop some standard method of recording the clinical findings in cases of cervical cancer. When I began using radium I did not appreciate the importance of the rectal examination, nor did I know that strictured ureter was a contraindication to operative cure. Every patient ought to be carefully examined and, so far as is possible, the exact extent of the growth determined and recorded before any treatment is carried out. A small cancer of the cervix with a movable uterus which shows two or three isolated nodules in the vaginal wall is inoperable. It might seem a very easily operable case if hasty or incomplete examination were made. With radium the treatment of such a case has a very different prognosis from the inoperable case due to extensive infiltration and fixation through the parametria. It seems to me, too, that the combination of radium and operation might be employed with advantage in the squamous cell cancers of the cervix, where the radium is capable of taking care of the local lesions but where there are regional gland metastases and where a thorough cleaning out of the regional glands operatively might be done in exactly the same way that we do in lip and breast surgery; I mean a radical Wertheim removal plus a thorough gland removal has proved to be too great a surgical undertaking and too fraught with a high mortality to be systematically carried out. I feel that it is a great mistake to discard our operative measures. I think the wisest course to pursue is to analyze our operable cases after separating them into three or four groups; some should have operation alone, some should be radiated alone, and some should have the combined treatment.

Dr. Kelly and I have had 34 inoperable or extensive borderline cases, all of which are well now, five years after radium treatment. I feel, therefore, that it is possible to permanently cure with radium, but it is undeniable that certain types of growth are very resistant to radium destruction and yet are curable by radical removal, provided they are not too far advanced. This we know positively to be the case in lip and skin cancers and it seems that it would likely be so in cancer of the cervix uteri.

DR. C. JEFF MILLER, NEW ORLEANS, LA.—After an experience covering a period of six years and comprising 104 cases of cancer of the uterus, I am thoroughly convinced that radium is the most valuable adjunct to surgery thus far suggested. It has been unfortunate that so much discussion has been indulged in regarding radium *versus* surgery. No one, except the earlier enthusiasts, has claimed that radium would supplant surgery and now that we have abundant clinical data, it is possible to determine the indications and limitations of radium, as we have previously done with radical hysterectomy.

From the statistics now available, I believe the following deductions will be acceptable to the majority of those using radium. In early cancer of the uterus, surgery is unquestionably indicated. It is possible that it may be eventually shown that the results of radium in the early stage, may equal those of surgery, but until this is known, we should insist upon operation. In regard to the borderline cases, we may just as positively insist that radium yields as good or better results than surgery.

In this group we feel that we have made distinct progress; for the operative results have never been satisfactory in eradicating the disease, and in addition they often furnished a train of postoperative sequelæ, that added to the burdens of the patient. I am confident that a large series of cases in this group will show better end results, than the same number treated by surgical intervention.

In advanced cases there is no longer any question but that radium accomplishes more than any other therapeutic agent. We have learned, however, that material from this group must be selected with some care. Fistulæ are so prone to follow radiation in cases presenting an advanced stage of ulceration, that it is occasionally wise to advise against radium. Originally, we had hoped to increase the operability of advanced cancer by first using radium, and operating after the process had been controlled. This hope has been dispelled by the insurmountable difficulties encountered in dissecting the pelvic structures after radiation. Some authorities still advocate operation in occasional cases, but on the whole I believe that once radiation has been undertaken, it should be continued without operation. Incidentally, it may be added here, that curettage and cautery in advanced cancer, preliminary to the use of radium, do not enhance the results of the treatment, and carry with them some objections.

We have not been able, as yet, to prove that the preliminary use of radium before operation in early cases, has any distinct advantage. It has a rational basis, however, and if operation is undertaken within ten days after radiation, no complications should be anticipated, and many cells, overlooked during the operation, may thereby be affected.

I am not certain that we have proved the value of postoperative radiation, although I recommend it. A few observers have studied parallel series, and proved to their satisfaction that recurrence was retarded, but such observations necessarily require a long period of time, and a large amount of material to definitely settle this point. Since we are gradually formulating clinical rules in regard to the use of radium, it is to be hoped that something can soon be authoritatively offered regarding the dosage. So far, this is still confusing, and capable surgeons and small institutions, who might purchase an amount that would place radium in a community, hesitate when one authority uses a gram, while another is using 50 milligrams.

The clinical results, at present available, do not show such a marked difference between the cases treated by massive dosage and those treated properly with a hundred milligrams, as to discourage the surgeon who has a limited supply.

We have all had experience with proctitis following the use of radium; just why the rectum should not tolerate radiation as well as the bladder, is not known, but every precaution should be taken to prevent it. In cases presenting rectal involvement, especially if symptoms of partial obstruction are present, a preliminary colostomy may be considered. I have resorted to this in several instances, and later applied radium freely to the vaginal vault and in the bowel, without causing annoyance. This is a point that should be emphasized, for not a single case complained of tenesmus.

My experience with vulvar cancer is practically the same as that related by Dr. Tausig. They do not respond as does uterine cancer, and my results have been disappointing. I had hoped that Dr. Burnam would have something to say regarding his results in this group.

Altogether we have distinctly advanced the status of the treatment of cancer by this valuable adjunct. We have alleviated pain, controlled infection and prolonged life in the hopeless cases; eliminated a large group from the surgical list, and frequently permanently cured cases in every group that were not amenable to surgical intervention.

DR. HAROLD C. BAILEY, NEW YORK CITY.—I think Dr. Graves' paper was very timely because it shows us that we still have more than one method of dealing with these cases of cancer. He is to be complimented on his statistics, especially with regard to early opera-

tive mortality. I take issue with him, as did Dr. Clark, on the preoperative or postoperative treatment. These are two problems that have to be worked out. The amount and time for the preoperative treatment must be definitely determined. I believe that, if the preoperative treatment is given, further postoperative treatment will have to be very mild. We have in the postoperative treatment great advantages. Here we use masses of radium and the parametrium is pretty thoroughly radiated.

Dr. Burnam brought up the question of the type of growth and this we must definitely understand. The columnar and basal cell type acts differently from the squamous cell. There is also a particular resistance or immunity of these individual patients to radium.

With regard to the control of dosage, we have now developed a method of measuring dosage, by the skin dose, so accurately that we can tell exactly how many centimeters into the parametrium the dose is delivered from within the uterus and vagina. Some of the bad cases do not respond to radium used on the limit of a skin dose and some of those treated in the routine way who unexpectedly have openings in the rectum, we find have a low skin dose.

DR. REUBEN PETERSON, ANN ARBOR, MICHIGAN.—The propaganda, in Michigan so far as cancer is concerned, may be said to have failed for cancer of the cervix. We have been endeavoring for the last ten or fifteen years to aid in the propaganda for cancer, but I cannot say that the operability is any better today than it was at that time. Therefore there is something Dr. Stone has brought forward which we ought to consider, namely, whether we have not been dwelling too much upon the cure of cancer by operation. If people are urged to take advantage of radium, we may get more women to come to us at a time when either radium or operation can be used to advantage. I fear, however, unless Dr. Stone and other men who are using radium are honest with the people, the same thing will happen as occurred in the operative treatment of cancer. All the patients undergoing the radium treatment will think they are going to be cured and in the popular mind the treatment will fall into disrepute if only a comparatively small number are cured.

I was delighted with Dr. Graves' results. He has not very definitely told us how the percentages were arrived at. Notwithstanding his explanation, I am free to confess I do not know what he means by 34.2 per cent or 19.1 per cent. So far as the figures are concerned, I cannot discuss his results, but I do know that he has had a very low mortality and, if combined with that low mortality of 5.2 per cent he can show at the end of five years a large number of patients living and well, he is to be congratulated.

I have never used radium in cases of cancer of the cervix; my work on such cases has been entirely operative.

I think what Dr. Burnam has said is perfectly true, that we are not scientific so far as our definition of what kind of cases we are operating upon or treating by radium. Until cases of cancer are standardized, the whole thing is bound to be in a state of confusion, so standardization should come as soon as possible.

When we turn to Dr. Taussig's paper and the chart he showed and the results, the outlook is not hopeful so far as combining radium with the operative treatment. We must perforce pay attention to the conclusions of men who have had such large experience with radium as Drs. Clark, Burnam, and Miller, and it will undoubtedly lead those of us who have no radium, but who have had simply operative experience with cancer, to consider whether it is not our duty to take up this treatment by radium.

JOINT MEETING HELD WITH THE CHICAGO GYNECOLOGICAL SOCIETY

- DR. HARRY E. MOCK, of Chicago, Ill., read a paper (by invitation) entitled **The Gynecologic Problems in Industrial Medicine**. (For original article see page 131.)
- DR. FRED L. ADAIR, of Minneapolis, Minn., read a paper on **The Development of Prenatal Care and Maternal Welfare Work in Paris under the Children's Bureau of the American Red Cross**. (For original article see page 141.)
- DR. GEORGE W. KOSMAK, of New York, read a paper entitled **The Importance of a "Follow-up System" for Obstetric Patients**. (For original article see page 155.)

DISCUSSION

DR. THOMAS WATTS EDEN, LONDON, ENGLAND (by invitation).—During the great war the people of the nations involved, men and women alike, had to consider the question of the value of the work they were doing from a new standpoint, that standpoint being not its value in pounds or dollars but its value to the state. We as doctors have likewise had to revise our ideas as to the value of our medical work.

The battalion medical officer in the field whose duty was to keep his men fit, to examine their teeth, to keep them clean, and to attend to their small ailments and complaints, was probably doing work as useful to his country as the surgeon performing brilliant operations upon men who were dangerously or hopelessly wounded. I think it is very important we should not lose sight of that lesson now that the war is over. The medical men and women who remained at home were engaged in getting the last ounce of productivity out of men and women who were engaged in industrial pursuits. Now, as I see these lessons, I think they ought to be to a great extent permanent lessons and, it seems to me, the time has come when we as obstetricians and gynecologists ought to ask ourselves whether the work that we are doing is as useful to the state as we can make it, or whether it is not. If it is not, then we should try to improve it. Up to the present time we have been mainly engrossed with surgical problems. When I think of what gynecology was like when I first graduated in the University of Edinburgh, it seems like a fairy story when one compares it with the present. When you think of what that great American, Marion Sims, was able to do, and what you can do in an American hospital today and see other men doing, the story is almost incredible. The same applies to midwifery. Lying-in hospitals sixty or seventy years ago were swept by periodic epidemics of puerperal sepsis, with a mortality of 30 to 50 per cent. Now we can conduct labor under hospital conditions almost without any risk to life. But I do not think that we can go on immersing ourselves in surgical problems and hospital questions alone.

As regards surgical problems, the limits to which we can go as surgeons have almost been reached. I have seen quite a lot of surgery since I came to your country about ten days ago, and I do not think that the ingenuity, the resources, the dexterity of the American gynecologist can develop very much farther. They will have to occupy themselves with some other problem. I think we ought to take a wide view of our responsibility and ask ourselves whether there is not something else we ought to develop other than surgical procedures. I would suggest that we ought to consider ourselves responsible for the care of the health of women and girls during the whole period of their sexual activity and during the whole process of reproduction, to the care of the special disorders to which they are liable, and to the care of the child during birth and the first month of its life. There is a great deal in this that is not surgery, but preventive medicine.

First of all, I would ask you to reflect on the position of midwifery. As a stranger in your country, I want to make it clear in the things I am going to say that I have no

intention of saying anything discouraging about midwifery in the United States, and what I am going to say applies only to England.

I think our hospital midwifery is very good indeed, perhaps almost as good as yours. We have to remember that while gynecology is in the hands of the elect, a few specialists, the bulk of midwifery in the country is done by general practitioners and midwives; that is, 40 per cent of the confinements which occur in Great Britain are attended not by doctors, but by midwives. The proportion of women who have their babies under hospital conditions and under the care of specialists is very small, and we find there is an enormous gap between the level of our hospital midwifery and the midwifery of the country as a whole. For every 1000 babies that are born in Great Britain a year, we lose four or five mothers, the greater number young and healthy women. Of this mortality, one-third is due to puerperal sepsis, which is a preventable disease. The remaining one-fourth is due to hemorrhage and other accidents of pregnancy and labor which proper attention would reduce almost to a minimum, and which we do reduce to a minimum in our hospitals. If the standard of midwifery were as good for the whole country as it is in the hospitals, we would at once reduce the puerperal mortality about one-half. I suggest to you that this is a condition for which we English obstetricians must consider ourselves, at any rate, partly responsible. It is no good blaming the doctors and midwives because it is our business to train them and fit them for their work; therefore, inasmuch as the bad results they get are due to imperfect training, the responsibility must rest upon our shoulders. The conditions are not exhausted by the statement I have made. We must remember that the mortality includes only the fatal cases of puerperal sepsis of which we have any record for a number of years.

We have now a system of notification of puerperal sepsis as of any other infectious disease. We have no reliable statistics upon the incidence of puerperal sepsis. One cannot put puerperal sepsis at much higher than 20 per cent; therefore, we have five times as much illness from puerperal sepsis as appear in our case mortality. This means an enormous amount of invalidism and illness and loss of productive capacity scattered over the whole country. In addition, we have an enormous bulk of minor septic ailments which are not reported and which do not cause death, but a month or weeks afterward these women come to the hospital for the relief of chronic infective conditions that we see so much of. This means further a very large amount of invalidism due to "bad midwifery" and then comes, of course, the question of permanent sterility which often follows these conditions. If we could by some method raise the level of the practice of our doctors, or approach the results which we get in our hospitals, we could relieve the country of the heavy maternal mortality as well as an almost incalculable amount of maternal illness.

Our infant mortality for the first year is somewhere about 10%; before the war it was 10.5%. I think it is something to our credit, notwithstanding the difficulties and complications in war times, that the mortality for 1919 was the lowest on record. It fell to 90, although the infant mortality is roughly 100 per thousand. Forty per cent of it occurred in the first month of the first year; that is, something like one-half of the mortality of the first year occurred during the period for which the obstetrician as a teacher is responsible. There is this confession I must make, too, and that is, although the infant mortality is diminishing, as I have told you, the diminution is apparent chiefly in the latter months, and not in the early months, and there is almost no diminution in the mortality of the first month. Therefore, I think the English obstetricians cannot comfort themselves by thinking the conditions as regards infant mortality in the period for which they are responsible are improving to any recognizable extent. I do not know whether such conditions as these prevail in the United States or not. If they do, I hope you will take the same view of it as we are taking, that is, it is our duty to set to work in the most serious way we can to find some remedy for this deplorable condition.

If we begin to ask ourselves what these bad results are due to, we come to the conclusion that they are mainly due to two conditions. The first I have referred to, that is, bad practice following bad training of our students, and second, to imperfect hospital provisions for midwifery cases. I believe that the latter difficulty is one which

you have not with you. My friend Dr. Davis told me the other day there was ample provision in American cities for all obstetric work. That is not the case with us. We have not sufficient hospital accommodations for midwifery cases and as a result it often happens that complications during pregnancy and labor cannot receive prompt, skilled assistance. We are laying down for ourselves the standard, that the country should provide for complications of pregnancy and labor ample hospital accommodations, as it has already provided for surgical complications. In a case of acute appendicitis there is usually no difficulty in finding a surgeon who is competent to operate on it. And so the country ought to provide equally for a serious obstetric emergency by finding some one who is capable of dealing with it the same as a surgeon is capable of dealing with an acute case of appendicitis.

The question of training of students is a much more difficult matter. I desire to state that the principle we are striving to have accepted by teachers is this: medical students should learn the conduct of normal labor and the common obstetric complications in hospitals under the eye of their teachers, and they should be given adequate experience in these ordinary complications before they are turned out to practice. A common requirement of the examining body is that students shall have attended a certain number of cases and they do not seem to care where they attended them. The student ought to be taught the conduct of normal labor as a surgical procedure in hospitals and by properly qualified and experienced teachers. I do not think there is any clinical subject in the whole curriculum of more importance from the point of view of the health of the public welfare than the training of the student in the conduct of normal labor. He can learn, if he likes, how to do a gastroenterostomy, but he will not do it for many years after he is qualified, he will have to attend confinements within a few months after the time he puts up his name plate. Yet he is taught this important task in a more clumsy manner from a clinical point of view than any other. If we could get these matters adjusted, we would go a long way toward improving our bad records as regards maternal mortality.

The case of the infant is quite serious, but I am glad to say we are on the right track to solve it. We have a net-work now of infant welfare clinics all over the country which are utilized for the training of medical students that are assistants to pediatric physicians, and very good work is being done in this way in training the medical students how to care for the infant in what I suppose is the most important period of its life, in which it stands in most need of scientific care.

There is one other point I would like to make; I do not think our hospital results are as good as they might be with regard to the baby. I think the infant mortality of labor in most lying-in hospitals is larger than it ought to be.

One of my friends in London (Dr. Holland) has been making a series of investigations on babies that died during birth. It is a research work done under the auspices of the government. His paper has not been published yet, but I have his permission to quote from it. He examined 168 dead babies, as they came from maternity clinics in London and in some other English towns. They were all short labors which had been attended with a reasonable degree of obstetric skill. I do not think any higher claim than that can be made for them because many of them were delivered by interns and not by the active members of the hospital staff. Fifty per cent of the babies died from intracranial injuries as proved by postmortem examinations. The injury, as a rule, consisted of a laceration of some portion of the membranes of the brain, followed by hemorrhage.

Dr. Holland had a certain amount of evidence, too, that minor injuries of this sort occurred from which babies recovered. They died sometimes of some other intercurrent condition during the process of healing of the laceration which itself is not fatal. So the suggestion is that there is a great deal of cranial injury done even by skilled attendants in normal labor in lying-in hospitals. Some of these cases were forceps cases, some breech cases, some were cases of normal delivery, but all of them showed these injuries.

Now, this is going to give us cause for a thorough examination of the methods em-

played because it is not only the question of babies that die of these injuries but we have to reflect on something beyond this. Is it possible that cortical injuries may occur in these conditions, sufficiently serious to cause permanent damage to the nervous system in later life. It is only by a prolonged system of "follow-up" that such a question can be answered, but it is a disquieting situation and one which we in England are taking seriously to heart.

Now, one or two words about the gynecologic question. As regards gynecology, I should like to make the suggestion that we perhaps have not paid sufficient attention to what is a very important period of a woman's life, and that is the period of secondary sexual development. Primary sexual development, of course, occurs *in utero*. If anything occurs seriously, we know the result is a gross developmental effect. Secondary sexual development is reached at puberty when the girl becomes a woman. There is a great deal of evident disturbance during this period which results in functional disorders of various kinds in the female sexual organs.

Some interesting observations were made some time ago by Malcolm Campbell, of Edinburgh, who showed that an arrest of development of the uterus in rats occurred by improper feeding. I think we should take into consideration the question as to whether we ought not to cause some systematic inquiries to be made into the effects upon the future sexual health of the girls, the conditions under which they live during the time of their secondary sexual development. For instance, there is a disorder we know by the name of spasmodic or primary dysmenorrhea. We do not know what it is due to. We do not know what to do with it. We do a number of small operations which are more or less successful or unsuccessful, as the case may be. It is curable by natural processes in the majority of cases but difficult for us to cure. Quite possibly it is the result of some defect or deflection during the period of secondary sexual development and sociological observers may easily settle such a question by undertaking a wide review and getting specific classified returns from large centers of population where girls of all ages and all classes can be observed under conditions in which they live. The results arrived at can then be classified and some important and valuable information may be obtained. If we can find some means of preventing the occurrence of this disorder, we would do a great deal indeed to prevent sickness, suffering and loss of work among the women of our country.

The status of woman is changing. The old idea that a woman is a delicate creature to be protected in time of danger and distress has quite gone by. I am sorry for the American or Englishman who suggests to any of his lady friends that is the proper rôle. Women are taking their places with men in every walk of life. They are in the professions; they are in business. During the war they put on trousers and did the work that men are usually employed to do. There is probably little they cannot do as well as the men; sometimes they do it better. Their only handicap is a physiologic one, and it is for us to educate the state, so that women shall have the fairest chance possible in the struggle that lies before them. These are very large responsibilities and if we are going to undertake them, we shall have to revise the character of our ideas of the work which gynecologists and obstetricians ought to pursue, and I make the suggestion to you in the hope that we may agree that the task is one which is worthy of our attention, and one which it is our duty to attempt.

DR. LEWIS J. POLLOCK, CHICAGO (by invitation).—Neurologists and gynecologists have, for generations, mutually shared the responsibilities of certain neuroses and psychoses. Not a long time ago the neurologist was instrumental in the collection of a great deal of pathologic material highly cherished by the gynecologists of the past generation: I refer to the numerous ovaries which were removed for the supposed cure of some types of mental disorder.

For many years there has been a constant effort to affiliate the gynecologist and the neurologist. Today this effort is reflected in such work as attempts to point out that the Abderhalden reaction shows a certain specificity to the sexual organs in dementia precox.

Hysteria has never been successfully divorced from its relation to the uterus. At first it was associated with the physical dysfunction of this organ, but with the advance in civilization we find it in close affinity with the *libido*.

Experiences in the recent war demonstrated conclusively some of the mechanisms entering into the formation of the neuroses, much, I think, to the disappointment of many men who uphold the theories of Freud which are based upon the hypothesis that hysteria and most of the neuroses are the result of repressions of unfulfilled desires which are related, in a broad sense, to the sexual sphere. Unfortunately for their hypothesis, the cases of so-called "shell-shock" were concerned with an illicit motive related to the instinct of self-preservation. Whether dealing with civil or with war neuroses, it is found that they occur in the presence of the conflict between the desires of an individual and his conceptions which have been built up by breeding, education, religion and social law. In the war neuroses occurred as the result of the inability of the soldier to adapt his wish to escape from danger and discomfort to his patriotism and his ideals; as a result there arose the defensive mechanism of a hysteria. Of course this process was an unconscious one. In civil neuroses the conflicts concern themselves not only with the instinct of self-preservation, but with the adaptation of an individual to social life. It is natural that many of these conflicts are related to the instinct of propagation of species and, therefore, sex.

Our ability to react adequately to the demands of society depends largely upon our education and, as a result, from a prophylactic standpoint, it is of the greatest importance that everyone be taught such things as particularly enter into the greatest conflict of life. The polish of civilization and the mask of society has not changed our status as animals. It is necessary to learn how to avoid the pitfalls encountered in the adaptation of our animal wishes to social mandates.

One of the great factors in the formation of neuroses is fear. Frequently this fear is related to masturbation. One thing has always forcibly impressed me; we are inclined to seek for this fear only among the male sex, although the same habit and the same fear occurs frequently in women. Insofar as sexual education is concerned the greatest efforts have been directed towards men. Fear reactions based upon incidents frequently occurring in childhood are often observed in the neuroses. In women these fears may be based on some unpleasant, disgusting, or frightful sexual experience, or some normal condition in the appearance of which they had not been instructed, for example, menstruation.

Inasmuch as the treatment of the disease is its prevention, it appeals to me strongly that we should make a definite effort to instruct all children during the period of the development of secondary sexual characteristics, in the physiology of sex, the normality of certain functions, the harmlessness of certain habits which will undoubtedly be exhibited by many children, and attempt to adapt them to a life in which the fulfillment of one's desires must be curtailed by social law.

DR. EMIL RIES, CHICAGO (by invitation).—The relation of gynecology and industrial medicine will impress the gynecologist a great deal more in the near future than it has done before. Industrial Medicine, Big Business, and Insurance will enter into our American medical life in a comparatively short time to such an extent that it behooves us to consider what is going to happen.

Dr. Mock, an apostle of industrial medicine in the United States, has mentioned already that under the present conditions a great many inferior men, men with insufficient education, men with insufficient experience, have gone into industrial medicine which seems to open up an easy way for them to make a sure livelihood. From such men we cannot expect any good from the standpoint of the development of industrial medicine. The consequence will be that questions of industrial medicine, so far as they concern the gynecologist, will soon be brought up to the Appellate Court of the Specialist, to determine the questions that have been raised by the industrial doctor.

There are not very many doubtful points in gynecology which are liable to appear in connection with insurance work. Congenital malformations can be ruled out. Obstetrical injuries have nothing to do with machinery. Tumors are more uncertain. But

the worst trouble we are going to have is with those conditions about which we ourselves are divided, the normal and abnormal positions of the uterus.

I heard Dr. Mock mention tonight as pathologic cases, one a sharp ante flexion, and three cases of retroversion. I am sure, there are quite a few gynecologists who do not consider a sharp ante flexion or a retroversion a disease. This question will come up in thousands of cases as soon as women who have had any injury in the course of industrial work present histories of headaches and backaches, which they explain on the basis of a malposition. The majority of general practitioners cannot make a diagnosis of retroversion or the position of the uterus in general. The average general practitioner cannot diagnose the position of the uterus at all, and when he does not feel the uterus he calls the position retroversion or retro flexion. Now the following is going to happen in hundreds of cases of industrial accidents: A woman in industrial work will come to the gynecologist and he finds a retroversion of the uterus. The first question is, did this retroversion exist before the accident? Second, whether it did or not, has it anything to do with the woman's symptoms? I can see twelve good men and true sit on the question and the Supreme Court will ultimately have to decide whether retroversion is a disease or not.

Dr. Mock opened up a wonderful vista of possibilities for gynecology. I have always regretted that women did not generally join the army and have an examination before they were admitted. If they received such an examination, we would know more definitely how many women carry the uterus backward and how many carry it forward. The percentages of the habitual positions of the uterus could be easily determined in that way, and Dr. Mock mentioned that certain industrial plants had started a system by which they insisted on a pelvic examination of their employees. That would be a wonderful and magnificent thing for us, and it would be the finest insurance for these industrial plants.

Naturally the women could not claim that their retroversion was due to an accident if they were known to have had it before they began work in the factory. The scientific gain would even be more enormous than the saving in dollars and cents for the insurance company. I foresee further that many of the functional disorders of the female, such as amenorrhea, dysmenorrhea, symptoms which are generally ascribed to gynecologic organic lesions, and yet rarely have anything to do with them, will be brought to the front. For instance, a backache will from that time on become more important to the gynecologist and attract his attention to a much more definite degree than it ever did before. When a woman files a claim for ten thousand dollars against the factory in which she is employed because she has a backache, we cannot disclaim the backache. Nothing is harder to disprove than an ache and that is where our gynecologic wisdom will be sorely tried. I foresee that we will have the same horrible spectacle that our good friends the neurologists have given the world in medico-legal cases. We may find five experts who will testify on one side that such and such is the case, and five for the other side.

I think industrial physicians and surgeons should use every effort to induce factories to insist on pelvic examination before employing women. Infections which are of a chronic nature and leave women with a more or less pronounced leucorrhea are very liable to be attributed by those women to their position in working or to the pushing of a piece of machinery against their body, etc. A jury is liable to be impressed with such statements. I was present in a case where a woman claimed that in consequence of stepping off a street car before the car had stopped completely, she had acquired carcinoma of the uterus and the jury gave her six thousand dollars.

Industrial medicine will do gynecology an enormous service if it will cooperate with the gynecologist in settling these important scientific points. Here is a wonderful chance, a chance the world never has seen before for gathering information about conditions of the female sexual tract which until now, for lack of large statistics, are still *sub judice*.

PRESIDENT DICKINSON.—When there is a school of hygiene in every city and an industrial clinic in every group of industrial workers, 75 per cent of the population in the urban and circum-urban regions will be in the hands of these preventories. In other

words, the greater part of the preventive work of the world two hundred years from now will be in the hands of the man who has written the first textbook about it and his colleagues. Industrial medicine is going to be a great development in the future of medicine, and it is time for us to get into it early and do our share of it.

I would like to introduce one speaker who taught me part of this work in the war in connection with the Shipping Board. He made a great record in this department and it gives me very great pleasure to introduce to you Colonel Philip S. Doane, now plain Dr. Doane, of Chicago.

DR. PHILIP S. DOANE, CHICAGO (by invitation).—Dr. Mock has spoken to you of industrial medicine largely from the standpoint of a surgeon. Most of the men in charge of industrial workers are surgeons; they know very little about gynecology. During the war I had charge of the health and sanitation of the shipyards and was much interested in the problems of their female employees.

In Washington and Philadelphia we had over 1000 women and girls who came to us from all parts of the country. They came for patriotic reasons; they also came for pocketbook reasons. These females were young, married, ex-married, and old. I tried to make a study of the gynecology conditions among these thousands of women and girls, and I divided them into various groups. First, the girls; second, the adult females; third, the ex-married women; fourth, the married women, and the wives of the male employees.

A few notations possibly will be of interest to you. The girls I found indifferent to any gynecologic conditions, usually because of ignorance. They were difficult to instruct because of lack of interest. They were afraid to report disease. I found that this class was most susceptible to seduction. I found that the lower or laboring class among these girls showed the most marked conditions which I attributed to lack of knowledge or to ignorance.

We established very shortly a dispensary staff and I called from the West nurses whom I had in my personal service to assist me in this particular work. From the intelligent nurses I was able to obtain quite a number of points of interest. I found it was necessary to follow Dr. Mock's ideas as he has given them to you and to carry out instructions with these girls in the care of themselves, their hygienic surroundings, dress, particularly food, which was difficult to obtain in Washington and Philadelphia during the war period, that is, food of the proper kind. We instructed them in habits and cleanliness. We also corrected the hours of work for these girls. I had the extended cooperation of my superiors who were heartily in accord with any measure that would add to the efficiency. We saw to it that these girls had proper light; that they had good, fresh air, proper drinking water, and good nutritious food.

We found the girls ate scantily at lunch time. A small piece of chocolate or something of that kind often sufficed. We looked into the toilet facilities which in many shipyards, in the offices, and so on, were very inadequate, very improper, and entirely wrong. The rest rooms we found to be of the very greatest importance. They were made clean, attractive, light and fresh. We placed competent trained nurses, as far as obtainable, in the various shipyards and offices, and in many instances we were able to obtain qualified women physicians. We found that the girls would not report to the male physicians and industrial surgeons, but would do so in many instances through the same nurse or competent female physician. We established clubs, exercises, and so on.

The adult females we found wiser than the girls as a general rule and they were open to instruction. We found the great majority of them had suffered from some past sad experience. They would readily consult a female doctor or a nurse. They appreciated every health and sanitary measure we established. We found the majority of ex-married women suffering from some female complaint and particularly among the laboring classes. We found, however, that it was difficult to obtain knowledge of their trouble because of their fear of being discharged. They would not report their trouble before employment. They might possibly report it after employment if promised a continuance of their job. They did not desire a record made of their disabilities. We found it advisable to keep a separate record of these cases, and the record was made after the

patient had left the dispensary, the record was not kept with the knowledge of the patient. We found that these ex-married women suffered from diseases usually of an infectious type, but in some instances the diseases were secondary to delivery by midwives. The married women in our employ were mostly young married women or recently married women. They were most willing to seek instruction and to be guided. They were not generally infected or diseased. They usually discontinued work on becoming pregnant. They profited by the previous instruction given them by the nurses or doctors. If the husband was an employee, his wife came under the care of the medical staff at the time of delivery. They were taught to avoid midwives.

What is the solution for this condition which confronts the gynecologist today? I feel that in every medical college there must be a chair of industrial medicine established. Dr. Moek already occupies such a chair and has a very great responsibility upon his shoulders. He must make preventive gynecology an important feature of instruction. The industrial surgeon must interest himself in this subject. I find female employees generally are ignorant in preventive gynecologic measures. I find the average trained nurse is more or less ignorant, and I find the industrial surgeon does not know anything, generally speaking of gynecology. This must be changed. The gynecologist in himself is absolutely too narrow; he is too much interested in operative work, too indifferent about a subject of this kind, and it is time that he should awaken to it.

DR. JOSEPH B. DELEE, CHICAGO.—As the hour is late, I shall make but few remarks on preventive obstetrics, particularly from a sociological point of view. The value of a pregnant woman to society is 100 per cent and her safeguarding depends upon the obstetrician. Why do we not have more obstetricians? Why do we have so many surgeons and so many men representing the other branches of medicine? The answer is very simple. The life of the obstetrician is not a happy one; the work is very hard, and the remuneration is inadequate. Careful and economic studies of women about to have babies are needed and it is more than possible that when industrial insurance and compulsory health insurance come the obstetrician will have to be one of the first to be consulted. It costs money nowadays for a woman to have a baby. The amount of time which prenatal work requires is not small. The number of visits, the number of urinalyses, the number of investigations of the woman's condition are large in the course of seven months antenatal care. The time spent in caring for the woman at labor is not minutes, but hours, sometimes days. Postnatal care also requires time and now comes Dr. Kosmak's follow-up system which will take another six months. If a few women can afford to pay for all this attention, well and good, but there are very many others who cannot afford to pay fees commensurate with the work; therefore, somebody must put up more money to give the poor women good obstetric care. Midwives cause a large percentage of the trouble, but the main reason for the trouble in women having babies lies in the function itself. Labor itself causes trouble. It is not possible for a large baby to pass from the uterus without causing material damage. How can we prevent this damage? We have to educate our doctors, but we cannot expect ideal results with obstetrics as low in public esteem as it is. People will not pay for obstetrics with the present standards. As long as the state allows midwives to practice obstetrics, people who have money to pay for it will not consider a confinement requires an expert, and so we have yet the task of raising the ideals of obstetric practice. If you will regard obstetrics as of pathologic dignity, you will immediately raise the ideal, for anything that is pathologic requires proper investigation and study and expert attention.

Dr. Eden reminded us of the high mortality of babies in normal delivery. It is a great confession on his part that a normal delivery can cause the death of the baby. I would say this is pathologic. Dr. Kosmak told us of the difficulties and the dangers of injuries to the pelvic connective tissue and cervix; that they have much to do in the causation of chronic inflammatory conditions in the pelvis. The prevention of these things requires a high degree of obstetric skill, much higher than is generally admitted, and the only way to get the public to appreciate that is to let them know that we doctors consider a normal obstetric case of the highest pathologic dignity.

DR. HENRY T. BYFORD, of Chicago, read a paper on **A Neglected Form of Cervical Endometritis.**

Dr. Byford said that the diagnosis and treatment of chronic endometritis, as they affect the middle and lower portions of the cervix, have been well described in our literature. But the same can hardly be said of inflammation at, or contiguous to, the internal os. Dilatation, eversion, erosion and cystic degeneration do not take place at the upper the same as at the lower end of the cervix. The internal os dilates only slightly. Its lumen is crowded with swollen and obstructed glands and the circulation is interfered with at first by the pressure from within and later from without by a contracting band of inflammatory exudate. On account of such interference resolution does not take place to the same extent as below and a ring of imperfectly organized connective tissue remains whose upper edge is at or just above the os and whose lower edge merges into the somewhat thickened mucous membrane below it. In multiparæ this band or constriction ring does not necessarily interfere with uterine drainage, but in nulliparæ it usually takes on some of the characteristics of stenosis.

The presence of this constriction ring is ordinarily overlooked by the practitioner who thinks in terms of tampons, and sometimes by the gynecologist whose scientific lenses are focused for operations. The reason is that neither one is looking for it and do not avail themselves of an intelligent use of the uterine sound. When the sound passes through the ring without resistance the condition is not suspected; when it encounters resistance the difficulty is attributed to faulty development or antelexion. The dilatation intended for the relief of the supposed defect sometimes relieves most of the symptoms for a short time and the patient is pronounced cured of what she did not have. But the symptoms either return shortly or the original condition persists in a slightly ameliorated form.

The diagnosis, made by means of the sound, is confirmed by the results of the treatment, viz., by the disappearance of the physical signs and the relief of subjective symptoms, such as backache, headache, reflex stomach disturbances, malaise, dysmenorrhea, menorrhagia, intermenstrual pain and sterility. The number and severity of the symptoms vary greatly in different cases, depending in part upon the interference with the lumen, the chronicity and associated pelvic conditions, and partly upon the patient's general resisting powers and nervous habits. Some patients do not complain of many symptoms, yet chronic inflammation in this location produces more subjective symptoms than in any other part of the uterus. Its symptoms are often attributed to a corporeal endometritis when such does not really exist.

In all cases of chronic cervical endometritis or supposed corporeal endometritis, we should search for induration about the internal os. The first and most noticeable sign in all but the most chronic cases, is pain produced by a slight pressure of the sound. When the os is anatomically small or is flattened by flexion, the pressure is not painful until it causes some dilatation or straightening, or at least until firm pressure is made. When the sound is passed through an inflammatory constriction with slight pressure, its withdrawal is followed by a show of blood at the internal os or by a stain of blood on the sound. In stenosis or under-development, not due to or connected with inflammation, it requires not only firm pressure but some forcible dilatation to produce a show of blood. That the tenderness is primarily at the internal os, and not due to a general intrauterine tenderness, is known by the cessation of the pain almost as soon as the bulbous end of the sound has passed the internal os, even though the sound be manipulated so as to impinge gently against the uterine walls above. When the constriction does not interfere with the passage of the sound, a little gentle manipulation can be made to locate the tender area at the internal os. The constriction ring seldom produces an abrupt and decided projection on the surface and the sound may feel as if it slipped over the edge of the thickened mucous membrane into the somewhat more spacious uterine cavity above. When the ordinary uterine sound thus passes without encountering resistance, a series of

graded sounds that taper slightly at the end are required both for diagnosis and treatment. In passing such a sound large enough to dilate slightly we produce the diagnostic pain and show of blood already mentioned. In very chronic cases moderate pressure may not produce the show of blood, in its place a lump of inspissated mucus, expressed from the glands, may be found adherent to the sound.

The ring of exudate can in some cases be traced by the uterine sound around the entire circumference; in others a part of the circumference will have no ridge but is flat, smooth, and of a cicatricial hardness indicating partial or complete local destruction of the mucosa. Dr. Byford recently had a case of bilateral deep laceration of the cervix in which by separating the labia he could see the smooth, red cicatricial flat surface posteriorly and the elevated ridge anteriorly. Both have been already recognized by means of the sound. The lateral lacerations were quite deep and probably the flat cicatricial surface represented the site of one or more superficial lacerations at the internal os which had not united.

In two cases the slight dilatation produced by the passage of the uterine sound caused the patients to faint when they got off the examining table. In several cases the patients have turned pale and dizzy, and have had to lie down or take a drink of water or go to an open window to avoid syncope. This would probably have occurred oftener but for the fact that many of them remained on the examining table long enough for the effect of the local irritation produced by the examination to wear off. This symptom is found more often in cases with old, well organized exudates. Painful dilatation of a small, comparatively healthy cervix may cause nausea and a feeling of faintness.

Treatment calls, first of all, for dilatation. Stimulating applications before any dilatation has been effected are not always borne well and sometimes aggravate the condition. Gradual progressive dilatation is preferred to extreme divulsion at one sitting. The latter is apt to produce one or more lacerations that extend through the constriction ring so that farther dilatation separates the lacerated edges of the ring without having much effect upon the exudate. Subsequent contraction takes place, requiring one or more subsequent divulsions, unless it is kept from contracting by the periodic passage of sounds the same as for progressive dilatation. The repeated mild stimulation of progressive dilatation with graded round dilators not only causes a steady improvement, but it more often cures the sterility which is the result of the presence of the inflammatory exudate rather than of mechanical obstruction.

When the patient cannot or will not stand the pain of progressive dilatation, the first one or two may be done under the influence of nitrous oxide gas. However, these dilatations are not carried far enough to cause lacerations and depend as much as possible upon the subsequent periodic use of the round dilators. A very slight increase in the amount of dilatation at each sitting is all that is necessary. This is done twice a week in such cases; once a week in those who can endure more at a time.

Before dilating, the vaginal vault and cervix is swabbed thoroughly with a 5 per cent solution of phenol; followed by a 20 per cent solution of phenol in glycerin to the entire uterine cavity. When a round dilator equal in size to a No. 25 urethral dilator French scale, can be passed without causing a show of blood or producing much pain, a stimulating solution of iodized phenol is applied to the entire cervical cavity and dilatation done twice a month for a few times and then once a month until the parts are in a fairly healthy condition. In cases with a large lumen the same treatment is used except that it is begun and ended with large dilators.

DISCUSSION

DR. ARTHUR H. CURTIS, CHICAGO.—I believe Dr. Byford wishes to especially emphasize the inflammatory constrictions near the internal os. My experience during the last fifteen or eighteen months has revealed a surprising number of strictures and granulations of the cervix. There is no question that these are an important factor in the production and persistence of a chronic discharge. However, irrespective of how careful one is in performing these dilatations, if one removes the normal constriction which nature has

placed at the internal os, there is likelihood of causing infection, not only of the uterus, but the Fallopian tubes.

I hope those of you who do follow out Dr. Byford's suggestions to do away with granulations and strictures will not dilate too frequently.

DR. HERMAN J. BOLDT, NEW YORK CITY.—Probably in recent years more attention has been paid to surgical gynecology than to minor gynecology, as we find it in office work.

The condition which Dr. Byford has spoken of has not been considered by me to be of an inflammatory character; but a mild degree of constriction is often found about the os internum and in the majority of cases dysmenorrhea is associated with it. As I remarked before, surgical intervention has played such a prominent part that the minor procedures have been lost sight of. The condition noted can be combated with a remedy that was thrown into the waste-basket long ago, namely, the intrauterine use of the galvanic current. You pass a sound on the same principle that it is used in genito-urinary work for strictures of the urethra without forcible dilatation. Using an electrode and a current of two milliamperes, with the negative pole in the cervical canal, continuing the current for ten minutes, that particular class of cases can be relieved. The 10 per cent phenol that Dr. Byford uses is usually a sufficient antiseptic. I believe this peculiar condition can be relieved more effectively by the method I have mentioned than by any other surgical intervention.

DR. ROBERT L. DICKINSON, BROOKLYN, NEW YORK.—The question whether this constriction at the internal os is pathologic or not, hinges very often, as far as the symptomatology is concerned, on whether metritis is or is not present. There may be a tiny opening with no symptoms whatever, but if the narrowing is connected with either a persistent or recurrent spasm, or a considerable localized metritis, an aggravated form of dysmenorrhea results.

What are the specific tests by which this condition can be determined? We have learned that some antelexions and some of the worst cases of spasm of the internal os disappear entirely under complete anesthesia. There is no evidence of what we thought we were going to find when we got the patient on the operating table. A case of dysmenorrhea in which we expected to find a very marked antelexion and narrowing at the internal os under the anesthetic was found to be simply a spasm. Sometimes I think the only way to make a diagnosis is by the use of an anesthetic. However that may be, a neglected procedure is to determine by the sound whether there is an area of excessive sensitiveness at the internal os which, when touched with the tip of the sound, produces a typical dysmenorrheic pain for which the woman comes to you. We have then two tests.

A third test is as follows: Take a Goodell or graduated dilator and dilate such a tender, narrow internal os, and the patient is free from dysmenorrhea for one, two or three months, and then it returns. Not having treated her in the meantime, again you do a dilatation, and again she is relieved of pain, and she comes back at stated intervals asking for that relief. That is as good proof as we ever can get of the value of the treatment. In other words, there are three tests of the question of an inflammatory or spasmodic or contracted internal os, or one around which there is an area of marked metritis, the test of complete relaxation under anesthesia; the test of extreme sensitiveness producing dysmenorrheic pain, and the test of a very mild office dilatation, carried on under antiseptic precautions which completely relieves the symptoms. I believe a large proportion of these persistent cases have a localized metritis around the internal os.

DR. THOMAS WATTS EDEN, LONDON, ENGLAND.—I should like to ask Dr. Byford whether he has any pathologic evidence bearing on this condition; whether he has had an opportunity to examine uteri showing this wall of cervical contraction. One must feel a little hesitation in concluding that we have a definite pathologic condition until we have been able to confirm it by direct pathologic observation.

DR. BYFORD (closing the discussion).—I have not taken out the uterus for this condition and therefore cannot demonstrate its pathologic character. The exudate in the

cervical endometrium is merely a little thicker at the internal os, where reparative processes are interfered with by a small lumen or by small lacerations and cicatrization. This extra thickness of the mucosa at the internal os would probably not attract attention in a specimen unless suspected.

Dr. Curtis warns us against too much dilatation. I have advised in my paper against wide dilatation. When I put patients under anesthetic I do not dilate widely for fear of producing small lacerations. If no laceration of tissue has been produced there is no danger of making the internal os permanently too large. It always contracts. I have these patients come once a month for two or three months to see that it does not contract too much. Except in those multiparæ in whom we have a large os due to lacerations during labor, I have not done any injury that kept the internal os patulous.

DR. REUBEN PETERSON, Ann Arbor, Mich., read a paper entitled **Errors in Gynecologic Diagnosis Due to Misplaced Organs.** (For original article see page 170.)

DISCUSSION

DR. GEORGE GELLHORN, ST. LOUIS, MISSOURI.—I am prepared to confess the following mistakes. This case concerns a multipara, thirty-seven years of age, who presented herself with symptoms of acute peritonitis. A large tumor was found in the lower right quadrant of the abdomen intimately connected with the uterus and I made a diagnosis of ovarian tumor with twisted pedicle. The diagnosis was not quite as clear as I would like to have had it because of the configuration of the tumor and its consistency, but that was the best I could do. On operation I found an enormous malarial spleen which not only traversed the entire abdomen downward into the right half and had become firmly incarcerated between the uterus and the right pelvic wall, but it turned a complete somersault, so that the upper pole of the spleen was in the depths of the culdesac, while its tail was in the region of the appendix.

DR. JOSEPH BRETTAUER, NEW YORK CITY.—We have all made mistakes in diagnosis. Sometimes they were justifiable and sometimes they were due to lack of proper appreciation of the symptoms or to carelessness. There are, however, instances where in spite of the utmost care we are not able to make a correct diagnosis. I am thinking at present of a very old case of mine and also of a recent one.

Some twenty years ago I had reason to believe that I had to deal with either an ovarian cyst with a long twisted pedicle, a tubo-ovarian cyst or hydrosalpinx. On opening the abdomen I found an adenocarcinoma of the ascending colon, with a very long mesocolon, which was just as movable as if it had arisen from the adnexa. There were no symptoms whatever from the intestinal tract. I resected a large portion of the intestine and the woman is still well.

A counterpart of this case is one I operated on two weeks ago. While my diagnosis was not certain, the probability as to the existing condition, in my mind, was one of two things, an atrophic adherent fibroid or a malignant condition of the appendages. The woman had passed the climacteric; she had a mass in the pelvis which was tightly adherent and intimately connected with the uterus. There were no signs whatever of involvement of the intestinal tract. I made a rectal examination digitally and with a proctoscope. On opening the abdomen I found the mass I had felt was the lower part of the sigmoid so tightly adherent to the posterior wall of the uterus that it could not possibly be separated from the uterus. After tying off both broad ligaments and cutting through the vagina, I lifted the uterus and sigmoid out of the abdominal wound, resected the sigmoid, made a lateral anastomosis. The specimen presented an enormous angular adenocarcinoma of the sigmoid.

DR. HENRY T. BYFORD, CHICAGO.—I should like to call attention to an interesting kind of tumor sometimes found in the culdesac of Douglas during pregnancy. I have two cases in mind. One of the most eminent surgeons in this city wanted me to operate on his wife

for a tumor in the culdesac. I told him to let the tumor alone and she would come through pregnancy all right. She did. Another doctor had discovered a tumor in the culdesac of a pregnant woman and wanted me to operate. I declined to do so, and she had no trouble from it. The mass was the prolapsed omentum in both cases. My attention was first called to this condition by a mistake in diagnosis. I diagnosed a tumor in the culdesac, I cut through the posterior vaginal vault and came upon the omentum. As there were no adhesions or other pelvic pathology I let it alone.

DR. N. SPROAT HEANEY, CHICAGO.—I had a case similar to the one which Dr. Peterson reports, of a tube prolapsing through the vaginal vault after hysterectomy. I did a vaginal hysterectomy, leaving the tubes and ovaries. The patient made an uneventful recovery but returned in a few weeks complaining of a very profuse leucorrhea. In my office, upon the introduction of a speculum into the vault of the vagina, I saw a granulomatous projection which I thought I might remove. Upon seizing it with tissue forceps, however, preparatory to snipping it off, the tube came out into the vagina. I removed the patient to the hospital and was able, under full surgical anesthesia, to enlarge the opening in the vaginal vault sufficiently to allow the complete escape of the tube, and by ligating the blood supply, was able to remove it without further incident.

I do not know how else I could have arrived at the diagnosis because I was quite unfamiliar with such a possibility.

DR. HIRAM N. VINEBERG, NEW YORK CITY.—A point I wish to emphasize is that an ectopic kidney is usually a single kidney and when one comes across a misplaced kidney one ought to be careful, if it is displaced and gives rise to trouble, before removing the kidney of making certain of the presence of another kidney. This can be readily done by exploring with the hand through the abdominal incision.

DR. CHARLES G. CHILD, JR., NEW YORK CITY, described, in discussing the paper, a case of wandering spleen adherent in the pelvis mistaken for recurrent carcinoma.

Mrs. A. G., 21 years of age; para I, with a difficult instrumental delivery two years ago, was operated upon July 15, 1905, dilatation, curettage and repair of the cervix. The abdomen was then opened by a transverse suprapubic incision. The adnexa of both sides were freed from adhesions, a left pyosalpinx removed, and the right tube resected for chronic salpingitis. Uterus replaced; round ligaments shortened. The pathologic report on the cervical tissue removed was carcinoma. On July 22, a vaginal panhysterectomy was performed. The convalescence from both of these operations was uneventful, and there was a marked general improvement of the patient's condition during the following year.

In October, 1907, she complained of considerable loss in weight, with pain in the pelvis, more particularly on the left side. Examination at this time showed nothing abnormal in the pelvis. She was again seen in December, complaining of an aggravation of all symptoms to which were added marked gastrointestinal disturbance. Examination showed considerable tenderness of the vaginal vault with marked induration and thickening around the broad ligament stump on the left side. Bimanual examination gave the impression of a recurrent growth in this region. The patient had grown progressively weaker since the examination in October and there had been a very marked loss in weight. No cachexia was apparent and she did not look as though she were suffering from a malignant process, notwithstanding the fact that all the clinical findings seemed to point toward a recurrent growth. On December 6, 1907, a median line incision was made and beyond some few large intestinal adhesions in the pelvis at the site of the previous operation, no evidence of any recurrent growth was found. A large and congested spleen lay in the left side of the pelvis, slightly adherent to the broad ligament stump. The splenic vessels formed a pedicle measuring nine inches in length. No evidence of a splenic mesentery was found. The adherent spleen, which was felt by bimanual examination, was what had been taken to be a recurrence of the original growth in the cervix. The spleen was freed from adhesions, an incision made at and parallel to, the free border of the ribs on the left side. The peritoneum was separated from the fascia, making a pocket into which the spleen was transferred, and then sutured behind the spleen, leaving only a small opening for the splenic vessels. The fascia and skin were then closed; modified Bardenheir's technic.

The patient made an uneventful convalescence, was entirely relieved of the abdomino-pelvic pain of which she complained before the operation, made a rapid gain in weight, and has been perfectly well up to date. The spleen has remained in its new extraperitoneal situation without causing any symptoms, and six months after the operation it had returned to practically normal size.

DR. PETERSON (closing the discussion).—Dr. Brettauer has nothing on his conscience. He made use of all methods of diagnosis, yet the preoperative diagnosis was not made. That was not the point of my paper. My paper was written because I thought it was well to point out the need of a more careful examination in all these pelvic conditions and to utilize all accepted methods before operation. We will make mistakes in diagnosis because we are human, but there are many new methods of diagnosis being perfected at the present time which will make our diagnoses more accurate. Among these may be mentioned x-ray examinations after gas injections of the peritoneal cavity. If we exhaust all methods and put ourselves clearly on record as to the preoperative diagnosis and then check up with the operation and the autopsy, it will be of great advantage. For instance, representatives from the American College of Surgeons in going around and investigating different hospitals found it comparatively rare for a diagnosis to be made and recorded prior to operation. My paper has served its purpose if it has shown the necessity of careful examination and diagnosis in all our cases.

(To be continued in the December issue.)

Department of Reviews and Abstracts

CONDUCTED BY HUGO EHRENFEST, M.D., ASSOCIATE EDITOR

Collective Review

Recent Literature on Eclampsia*

(A Critical Review)

BY HUGO EHRENFEST, M.D., F.A.C.S., ST. LOUIS, MO.

A STUDY of the obstetrical literature of the past few years reveals the surprising but very evident fact that the war has actually stimulated the interest of the investigator in the etiology, and of the practitioner in the successful treatment of eclampsia.

As early as 1916, Warnekros¹ emphasizes the fact that practically all large maternity services of Germany and Austria have noticed a material decrease in the number of their eclamptic patients. In most instances the statistical record of this fact is accompanied by some explanation which for obvious reasons deals with the etiology of this disease. Thus Mayer² speaks of a general toxic effect of sperma resorption which occurs in the course of pregnancy when sexual relations continue without interruption under normal conditions. A corresponding benefit, therefore, is derived from the absence of the husband in war service. This hypothesis evidently has not met with much favor. It is extensively discussed by numerous writers and almost without exception repudiated. Warnekros, who also deals with this hypothesis in detail, states that the majority of writers seem to regard as more acceptable an explanation offered by Ruge³ which ascribes this reduction in the number of eclampsia patients to the marked deficiency of the war diet in fats, and especially in proteins. But many objections are raised also against Ruge's theory. Mayer asks: "How can this explanation be made to harmonize with the indisputable increase of nephritis during the war also ascribed to food conditions?" Franz,⁴ answers that "war nephritis" is the result of the many epidemics of infectious diseases which have swept through Europe. A Gynecologist, serving in the Austrian army, enters the discussion by offering statistical proof that the soldier, physically exhausted and persistently exposed to colds, is likely to develop a nephritis merely from the toxicosis caused by the various prophylactic vaccinations. Therefore, the evident frequency of war nephritis has no bearing on the eclampsia problem. Gessner⁵ thinks that the seeming benefit of the war conditions to the pregnant woman in protecting her against eclampsia, is entirely due to the prevention of overeating in combination with the advantage of increased physical activity forced on her by war conditions. Zangemeister⁶ doubts both the feasibility and possibility of establishing, by statistics, the relation of the changed food conditions to eclampsia, and feels satisfied from his own studies that this apparent decrease of eclampsia is almost proportionate to the decrease in the birth rate. With that sagacity, so often noticeable in his controversial papers, Lichtenstein⁷

*Based on a paper read at the meeting of the American Gynecological Society, May 24-26, 1920.

discusses, and finally repudiates, all these theories and explanations. An analysis of the eclampsia cases, treated in the large German maternities before the war, shows that a considerable number of them had been brought from distant places. The inefficient, at times completely interrupted, railroad service, the absence of all automobiles, the notorious inadequacy of ambulance service for the civilian population and the crowded condition of all hospitals, necessarily prevented many eclamptic women from being admitted to hospital wards. To this probably large number of patients unable to reach the clinics must be added another group which now is kept out of hospitals by the attending physicians. The insistent teaching of obstetricians during the past decade that forced delivery by no means is the only method of dealing with eclampsia, that the conservative treatment is useful and indeed preferable in many instances, is fortunately beginning to bear fruit. The practitioner has finally learned the technic of the Stroganoff therapy which can be carried out adequately in the home of the patient. Also after the return of normal conditions, Lichtenstein expects the larger clinics to see fewer eclamptics than before the war.

Ruge⁸ and others contribute elaborate papers on the question of the etiologic importance of defective liver function, first suggested by Dienst. This theory in some of the papers is likewise linked to the problem of changed food conditions during the war. Schickele⁹ objects, because most careful metabolistic studies fail to reveal any disturbance of liver function during pregnancy. Pathologic tissue changes in the liver, varying in character and extent, indeed, are found in all severer forms of pregnancy toxemia. However, they are not the cause but only the result of the intoxication, and appear coincident with similar changes in other organs, e. g., the kidneys. To a similar conclusion comes Dahlmann¹⁰ when he finds, by animal experiments, that even an extensive mechanical impairment of the liver does not prevent the organ from responding satisfactorily to the increased demands made upon it by pregnancy. In this connection mention may be made of an observation, not unique but rare, of a severe peritoneal hemorrhage from the liver in an eclamptic patient, reported by Herz.¹¹ Bory¹² advances a novel hypothesis: Eclampsia is caused by a functional deficiency of the placenta which permits fetal toxins to pass into the maternal circulation unmodified. Two very exhaustive studies seem to dispose of the older conception that eclampsia represents an anaphylactic condition. Eisenreich¹³ bases his objection on a series of animal experiments and a comparative study of complements in the blood of women, pregnant or in labor. Zinsser¹⁴ concludes that eclampsia cannot be an anaphylactic shock because it is not a toxemia brought on by the destruction of proteins. Yet, Bruett and Schumm¹⁵ emphasize that the eclampsia virus quite frequently reveals a marked tendency to destroy blood cells. In eclampsia the blood serum shows an increase of hematin proportionate to the severity of the intoxication. It is impossible to say whether these blood changes are due to placental toxins, or should be explained as an anaphylactic phenomenon. Certain clinical findings, which seem analogous to those of serum hemoglobinuria, in their opinion, speak rather in favor of an anaphylactic process.

The acidosis theory of eclampsia has been considerably weakened by the investigations of Slemons.¹⁶ He finds in the blood in eclampsia and allied intoxications during pregnancy a normal quantity of amino acids and a slight retention of nitrogenous waste products, usually an unimportant augmentation of cholesterol and a reduction of lecithin. He concludes, that, in general, these studies do not support either the hypothesis of acidosis or one of a derangement of the protein metabolism. Emge¹⁷ ascertains that the

acidosis of a toxemia of pregnancy, as a rule, is only equal to the acidosis of normal pregnancy.

The corpus luteum is considered the source of the eclampsia toxin by Westermarck.¹⁸ He is so thoroughly convinced of the scientific justification of this view, that he actually proceeds to carry out the only logical treatment in accord with this theory: Elimination of the toxins already in the organism by venesection and prompt emptying of the uterus; and prevention of further resorption of toxins by the removal of the corpus luteum. He performed this operation in seven cases, twice simultaneously with a Cesarean section, and claims to be entirely satisfied with the results so far obtained. Although hyperemesis represents a toxemia of early pregnancy and eclampsia one of the later stage of gestation, Westermarck's theory cannot fail to remind one of Hirst's¹⁹ recent claim that hyperemesis is the result of lacking corpus luteum function. He assumes that the increase in the size of the corpus luteum during the first three months of pregnancy indicates that none of its secretions are resorbed. It would be out of place to discuss here Hirst's theory in the light of certain physiologic facts, or its relation to the probable importance of corpus luteum function in the implantation of the fertilized ovum, but the fact is worthy of emphasis, that Westermarck seemingly cures eclampsia by removing the corpus luteum, and Hirst apparently relieves hyperemesis by injection of corpus luteum extract. The theory of one or of both, of necessity, must seem wrong.

Zangemeister²⁰ reiterates his contention that the eclamptic convulsions are caused by an abnormal intracranial pressure, the result of an acute edema of the brain, which in turn is brought on by the increased general blood pressure. Proper eclampsia treatment, therefore, must attack, prophylactically, the cerebral edema by reducing, therapeutically, the high blood pressure. Entirely in accord with this theory seem the observations of Kirstein.²¹ He finds that the pressure of the intraspinal fluid remains at the normal level during normal pregnancy, but is markedly increased in eclampsia, proving the existence of an abnormal intracranial pressure. The convulsion is released by a further augmentation of the already abnormal blood pressure, which during the convulsion causes an added rise in the intracranial pressure.

As stated above, the development of a new theory concerning the causation of eclampsia almost without exception is linked with the proposal of a new, more rational form of treatment. Therefore, it is not possible, however desirable, to group in this survey the references to literature under the distinct headings of etiology and therapy. For similar reasons also the literature dealing with symptomatology and diagnosis will have to be considered, at least in part, in connection with newer suggestions of therapeutic measures especially of a prophylactic nature.

A thorough critical analysis of eclampsia therapy leads Ruge³ to the following deduction: Notwithstanding all therapeutic efforts a certain and unfortunately not a small number of eclampsia patients will die. Irreparable damage to life-sustaining organs, such as kidney or liver, is already done when the symptoms first become manifest and the treatment begins. But also fatal secondary derangements in lungs and heart cannot always be avoided successfully. In these respects better results can be hoped for only by better prophylactic care, when physicians more carefully than heretofore will watch for all suspicious prodromal symptoms of the toxemia. Appropriate measures, which include bed rest, diet, the administrations of alkalis, and prophylactic venesection, must be instituted early, and when nevertheless the symptoms tend to become more aggravated, not too much time should be lost in inducing labor. Dice,²² in a discussion of the indications for interference in preeclamptic toxemia, lays particular stress on the importance and value of an examination of the eyeground. It is the belief of Cauwenberghe²³

that not enough attention is paid to gastric symptoms, pain in the epigastrium and vomiting, as premonitory signs. That there are occasional exceptions to the almost invariable rule of a rise in blood pressure, and that this important symptom might be absent in eclampsia, is incidentally mentioned by Danforth.²⁴ The true index of the preeclamptic state, called by him eclampsism, according to Pacheco,²⁵ is a characteristic change in the specific gravity and in the chloride contents of the urine. He also describes distinct changes in the sphygmographic records. In the prophylactic treatment of cases of eclampsism he employs an exclusive milk diet, allowing some water only in extreme cases. Injections of a sugar solution prove useful in reducing the concentration of the urine and promoting diuresis. For the purpose of reducing the blood pressure and of eliminating toxins he performs venesections, two and three times a month, withdrawing never more than from 100 to 120 grams of blood at a time. Diuretics should be accompanied by a total or partial restriction of salt. No meat shall be allowed.

In view of the advocacy even of repeated venesections in the preeclamptic state, mentioned in preceding quotations, it seems interesting to state that occasionally serious objection is raised against its employment. In a plea for an eclampsia therapy which would entail the least amount of shock and trauma, Cragin²⁶ says: Eclampsia patients after convulsions resemble so closely patients in shock, that venesection seems illogical. They seem to need all the blood they have and more too. Abandonment of phlebotomy by Cragin apparently has not interfered with his results. For the reduction of the blood pressure he prefers *veratrum viride*.

In regard to the problem of a specific treatment of eclampsia mention must be made of an article by Villanueva²⁷ in which he describes most satisfactory results in 12 cases with intravenous injection of a sodium bicarbonate solution. He bases his therapy on the assumption that eclampsia is due to acidosis, a theory greatly weakened, if not entirely exploded, by recent work quoted in the foregoing pages.

Unsatisfactory results with thyroid medication are ascribed by Percy²⁸ to the obvious insufficiency of the small dose customarily administered. He gives a daily dose of 50 grains of the dried gland for one or two weeks in urgent cases, and a correspondingly smaller dose, between 12 and 20 grains daily, for less severe cases.

Considering finally the general attitude of recent writers in regard to an active or conservative mode of therapy for women actually seized with eclamptic convulsions, we meet at least with two writers who cannot find any advantage in temporizing measures. Laphorn Smith²⁹ very emphatically proclaims that after a convulsion has occurred one should not give chloroform, chloral, or *veratrum viride*, or employ venesection. *Accouchement forcé*, vaginal Cesarean section or craniotomy then are not any longer justifiable, while abdominal Cesarean section always is the one safest operation in surgery. If possible, still more radical seems Poucher³⁰ who says: "When a patient, at or near term, in spite of all means of elimination, shows by nervousness, sleeplessness, severe headaches, high blood pressure, edema, and excessive albuminuria that convulsions are imminent, why wait until the patient has become eclamptic? A severe preeclamptic toxemia case should never be allowed to suffer hard or prolonged labor pains. In primiparæ, who represent 75 per cent or more of eclamptic women, abdominal Cesarean section, done with ether or gas-ether anesthesia, offers by far the best results."

Undeniably, however, more prevalent among modern writers is the tendency to advocate conservatism. Carefully analyzing his own work from the viewpoint of the respective advantages and disadvantages of conservative and radical methods in the practice of obstetrics, Austin Flint³¹ concludes that, in general, probably more favorable results, both for mother and child, could

be expected from more conservatism in obstetric therapy. In regard to eclampsia in particular, he is convinced that in a large proportion of cases the actual development of the disease could be prevented by an earlier recognition of toxic conditions in pregnancy. Asa B. Davis³² emphasizes that at least in some cases the active treatment will hasten the end of a patient in a hopeless condition though the child might be rescued. Unfortunately, however, these children on account of prematurity and their intoxication show a very high mortality. When Ross McPherson³³ makes an urgent plea for the conservative treatment of eclampsia (a slightly modified Stroganoff treatment with venesection), he expresses, by way of an introduction, his fear that his suggestion might "bring on his head a storm of adverse criticism and disbelief at the present time when the radical operative methods are almost universally in vogue and are preached and practiced so consistently by the majority of obstetricians throughout the world." From a confirmed radical he had changed "to what some may call an overconservative." McPherson's fear seems unjustified. Mention has been made of Lichtenstein's explanation of the decrease of eclampsia patients in the maternity hospitals as in part due to the persistent teaching of more conservatism in its treatment. Winter³⁴ in a large monograph discusses exhaustively eclampsia treatment in all its known forms, and then asserts that in future the discussion cannot any longer deal with the old problem of "operative versus conservative" therapy. This question now is definitely settled. Both methods are firmly established and both have their respective definite fields, and at times are advantageously combined in the treatment of the same patient.

It seems that there is one point often overlooked in scientific discussions of eclampsia therapy, although it is of paramount importance to the practitioner of medicine. Radical operative measures yield entirely satisfactory results only in the hospital practice. Certain conservative methods, on the other hand, have proved satisfactory both in the hospital and in the home. At the present time, and probably also in the future, the overwhelming majority of all obstetric patients must be managed in the home. It, therefore, remains the indisputable duty of scientific obstetrics to improve primarily the conservative methods of treatment because they will benefit the greatest number of patients. Though obviously incomplete and necessarily concise, the numerous quotations from recent eclampsia literature, offered in this survey, seem to justify the following general deductions: The question of the etiology of eclampsia is still unsolved. The therapy of eclampsia seems to tend towards more conservatism. No new specific treatment has been discovered. The importance of early diagnosis and of early prophylactic treatment of the preeclamptic state is generally appreciated.

REFERENCES

- (1) Zentralbl. f. Gynäk., 1916, xl, 897. (2) Zentralbl. f. Gynäk., 1916, xl, 793. (3) Zentralbl. f. Gynäk., 1916, xl. (4) Zentralbl. f. Gynäk., 1917, xli, 480. (5) Zentralbl. f. Gynäk., 1919, xliii, 1033. (6) Ztschr. f. Geburtsh. u. Gynäk., 1917, lxxix, 124. (7) Zentralbl. f. Gynäk., 1917, xli, 473. (8) Monatsh. f. Geburtsh. u. Gynäk., 1918, xlvii, 37. (9) Arch. f. Gynäk., 1917, cvii, 209. (10) Ztschr. f. Geburtsh. u. Gynäk., 1916, lxxviii, 86. (11) Zentralbl. f. Gynäk., 1918, xlii, 572. (12) Progres Medical (Paris), 1918, xxxiii, 12. (13) Samml. klin. Vortr., Gyn., 1914, No. 694. (14) Ztschr. f. Geburtsh. u. Gynäk., 1916, lxxviii, 453. (15) Ztschr. f. Geburtsh. u. Gynäk., 1918, lxxx, 145. (16) Am. Jour. Obst., 1918, lxxvii, 797. (17) Am. Jour. Obst., 1918, lxxvii, 813. (18) Arch. f. Gynäk., 1919, ex, 517. (19) Am. Jour. Obst., 1919, lxxix, 327. (20) Ztschr. f. Geburtsh. u. Gynäk., 1917, lxxix, 124. (21) Arch. f. Gynäk., 1919, ex, 328. (22) Am. Jour. Obst., 1918, lxxvii, 76. (23) Revue de Gyn. et d'Ob., (Paris), 1919, xvi, 294. (24) Am. Jour. Obst., 1918, lxxvii, 922. (25) Arch. Brasil. de Med. (Rio de Janeiro), 1919, rev. in Jour. Am. Med. Assn., 1920, lxxiv, 428. (26) Am. Jour. Obst., 1917, lxxvi, 211. (27) Reforma Medica, 1919, rev. in Jour. Am. Med. Assn., 1920, lxxiv, 988. (28) Am. Jour. Obst., 1918, lxxvii, 123. (29) Brit. Med. Jour., 1919, ii, 101. (30) Am. Jour. Obst., 1918, lxxvii, 54. (31) Am. Jour. Obst., 1918, lxxvii, 708. (32) Am. Jour. Obst., 1918, lxxvii, 62. (33) Am. Jour. Obst., 1918, lxxvii, 58. (34) Ztschr. f. Geburtsh. u. Gynäk., 1916, lxxviii, 366.

Selected Abstracts

Urinary Bladder after Operations

Laroque: Gauze Sponge Expelled from Urinary Bladder. *Journal American Medical Association*, 1919, lxxii, 218.

Patient presented a history of a laparotomy performed some time ago, at which the appendix and left ovary were removed and the uterus suspended. No drainage was employed. She was perfectly well, when suddenly seized with agonizing bladder tenesmus, and spasmodic incontinence, expelling urine which contained a large amount of foul-smelling pus. Roentgen examination for stone negative. Temperature varied between normal and 101° F. On bimanual examination a small mass was felt in right fornix. During an attempt to catheterize the patient a piece of gauze was discovered in the urethra. This was pulled out and proved to be a surgical sponge, about two by ten inches. Symptoms subsided immediately and patient was well within a week.

Stoeckel: Entrance of Gauze Sponge into Bladder after Prolapse Operation. *Zeitschrift für Gynäkologische Urologie*, iv, 38.

While the passing of sponges and even of small instruments into the bladder after laparotomies has been recorded repeatedly, this occurrence after vaginal operations seems rather rare.

The patient was referred to Stoeckel after long continued local treatment of a severe cystitis by another physician. A cystoscopic examination, finally made, easily revealed the presence of a large stone in the bladder. Stoeckel suspected a ligature stone. He suggested a cystotomy but was forced by the patient first to try a lithotripsy. The stone seemed to yield, pieces broke off and then it became obvious that the nucleus of the large concretion was formed by a softer mass. Grasping it firmly with the lithotriptor he pulled about 4 cm. of a gauze strip through the urethra when further progress was made impossible by the retained portion of the concretion. Though he knew that the patient had been operated for a prolapse he decided to open the bladder through the vagina. A long longitudinal incision in the anterior vaginal wall failed to expose the bladder wall as expected. The operation performed on the patient had been a Schauta-Wertheim uterine interposition. Thus he was forced to free the entire uterus from its bed before he was able to reach the bladder. Through an incision he finally extracted the entire sponge with its adherent concretions. He closed the bladder with two layers of catgut sutures, and reinforced the closed incision by replacing the uterus into its forced anteposition. Convalescence was prompt and the patient was discharged well two and a half weeks later. The writer emphasizes in this connection the necessity of obtaining, in the interposition operation, a perfect approximation between the transferred bladder and the posterior uterine wall, because the uterus lying in front prevents the escape of any material, even of blood, from the remaining pocket.

Hirschberg: Unusual Location of Ligature Stones in the Female Bladder. *Zeitschrift für Gynäkologische Urologie*, iv, 100.

Bladder stones are notoriously rarer in women than in men. Both the genuine urinary calculi and those forming over foreign bodies introduced through the urethra (comparatively common) obviously lie as a rule on the floor of the bladder. In contradistinction, ligature stones often are found attached to the bladder wall. This special group of stones by some writers

is divided into primary stones forming around ligatures placed into the bladder wall itself, and secondary stones forming around ligatures which have migrated into the bladder cavity from more distant places. Among the ligature stones those of the secondary type are seen less often. The noteworthy feature of the case recorded by Hirschberg was a secondary stone between bladder and anterior fornix so that it was more a "vaginal" than a bladder stone. This patient had been operated through the vagina for a left-sided tubal pregnancy. Bladder difficulties had begun soon after the operation. The simple removal of the stone, size of a cherry, with seissors and dissecting forceps from the vagina led to the formation of a small fistula which closed promptly with disappearance of all symptoms. This patient had been subjected to useless local treatments for a long time, though a vaginal examination easily would have lead to the correct diagnosis.

Curtis: The Bladder of Women after Operation. American Journal of Obstetrics, 1918, lxxvii, 230.

In this paper is furnished final statistical proof for the correctness of certain contentions expressed by the writer in a preliminary report presented two years previously. With added experience in the management of 465 operated cases he now formulates the following conclusions and therapeutic suggestions: Both in disease and in experimental work, when virulent bacteria pass through a normal bladder, they do not tend to infect the mucous membrane. Similarly, when catheterization is performed for conditions other than relief of retained urine, subsequent infection is a rarity. On the contrary, cystitis, which develops after catheterization to relieve a distended bladder, occurs despite the utmost care. Retention of urine, therefore, is the most important factor in the development of postoperative cystitis. Cystitis seldom occurs from cleanly and careful catheterization of a healthy, physiologically normal bladder.

All patients who complain of distress are catheterized, distention must be avoided. Whenever there is doubt that the patient is actually able to completely empty the bladder, the catheter is introduced to ascertain the possible presence of residual urine. Even in doubtful cases catheterization is preferable to a possible stasis of urine. While it is admittedly preferable to dispense with the catheter, decidedly better results are obtained when the catheter is passed without the slightest hesitation to prevent overdistention or incomplete emptying of the bladder.

Curtis states that his own investigations only confirm almost identical observations and deductions made some years ago by Taussig. The general adoption of this rational prophylaxis against postoperative cystitis seems to encounter unusual difficulties through the well established fear of nurses (and physicians!) of producing a cystitis by catheterization. In the light of these newer investigations the "catheter cystitis" is not a result of *commission* but rather of *omission*.

Esch: Postoperative Cystitis. Archiv für Gynäkologie, 1919, cx, 659.

The known greater liability of cystitis after operations in the female than in the male is chiefly due to the fact that unfortunately in many of the gynecologic operations it becomes necessary to separate the bladder more or less extensively from its surrounding tissues. Traumatism to blood vessels and nerves then often leads to parietic conditions of the bladder wall. The patient is either unable to void at all, or to empty the bladder completely. This incomplete ischuria, as pointed out by Bumm, is one of the chief factors in the development of the cystitis, the residual urine forming a suitable

culture medium for the germs, unavoidably introduced with the catheterization. Some writers for this reason have pleaded for keeping a retention catheter in the bladder for several days in all patients unable to empty the bladder completely. In Esch's opinion the customary preoperative diet also represents an important additional factor in the causation of the cystitis. A reduction in the normal acidity of the urine diminishes its ability to inhibit bacterial growth. Esch strongly advises to continue the customary practice of avoiding, as long as possible, the introduction of a catheter, and to follow each catheterization with an antiseptic bladder lavage. He advocates the use of urinary disinfectants by mouth, and states that the treatment of the postoperative cystitis in general is identical with the customary treatment for cystitis. These conclusions are based on a very thorough study of the bacteriology and chemistry of the urine in cystitis, and the effect of certain urinary antiseptics.

Broun and Rawls: Cystoscopic Study of End-Results of Cystocele Operations. Surgery, Gynecology and Obstetrics, 1918, xxvi, 502.

The writers studied the interior of the urinary bladder of 49 patients on whom hysterectomies, interposition and trisection operations for procidentias, and also abdominal operations had been performed. In striking contrast to the fact that the very large majority of patients stated that they had been entirely or in part relieved by the operation from previous urinary symptoms, were the cystoscopic findings. The bladder base exhibited a normal appearance only in nine of the cases. In all the others, even the widely distended bladder showed convolutions and sulci. It seemed that the character of the operation performed did not influence to any marked degree the extent of such permanent folds. While not causing any noteworthy disturbance, the writers consider them objectionable, at least theoretically, as the result of a cystocele operation. They conclude from their investigations that a free separation of the bladder from the mucosa and fascia will enable the operator to coapt the fascial pillars with the minimum amount of puckering of the overlying bladder wall.

Lindeman: Chronic Trigonitis in the Female. Surgery, Gynecology and Obstetrics, 1920, xxx, 64.

"Irritable bladder" in women may be due both to extrinsic and intrinsic causes. Among the extrinsic causes may be mentioned pressure by the gravid uterus, and uterine, ovarian, or pelvic newgrowths; distortion by extravesical tumors; displacement by cystocele and prolapse and, following interposition operations; congestion from a similar general pelvic process due to inflammation, pregnancy, etc. Among the intrinsic causes may be mentioned cystitis, newgrowths, foreign bodies including calculi, etc. In the past, an irritable bladder with no gross findings in the urine, was usually diagnosed a "bladder neurosis." Bladder symptoms due to nervous diseases, however, are usually of a different type: dribbling, loss of control and retention, rarely irritability. Careful cystoscopic examination of these irritable bladders reveals definite changes in the trigone as the chief pathologic feature, and to this group of cases Lindeman applies the term cystitis colli or trigonitis. The exact cause of this condition is not known. The onset of the disease is usually insidious with gradually increasing frequency of urination, usually without pain. When the condition becomes aggravated (it is usually chronic and progressive) the desire to urinate becomes almost constant.

For the treatment of this disease the writer recommends the following entirely new method: By means of a special needle attached to a Brown-

Buerger cystoscope, injections are made into the tissue of the trigone. The fluid employed for the purpose is a 2 to 2½ per cent solution of quinine and urea hydrochloride in sterile normal saline. The results, he asserts, have been most encouraging; there have been no failures and no bad results. Details of the rather difficult technic of this method are given in the paper.

ERRATA, OCTOBER ISSUE

In the article of DeLee, page 34, paragraph 1, the concluding sentence should read: As regards the pain, the rapid spread of the twilight sleep craze will show the demand for painless labor, and also that "tokophobia" is spreading among women.

Page 36, seventh line from bottom, insert "and" after "injuries."

Page 38, sixth line from bottom, should read "levator ani" instead of "levator and fascia."

Page 43, paragraph 5, second line, should read, "the physical labor of a prolonged second stage."

Page 44, line 7, insert "the" before "general."

Article of Dr. Watkins, page 92, paragraph 4, line 2, should read: "the wound has healed in from 25 to 50 per cent less time than when I used more radical treatment."